pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

CEMENT, LIME, GYPSUM, CRUSHED STONE, SAND, GRAVEL AND OTHER NONMETALLIC MINERALS

may 1961

The NEW LOOK in Agstone Production

See...

LIME and AGSTONE INSERT

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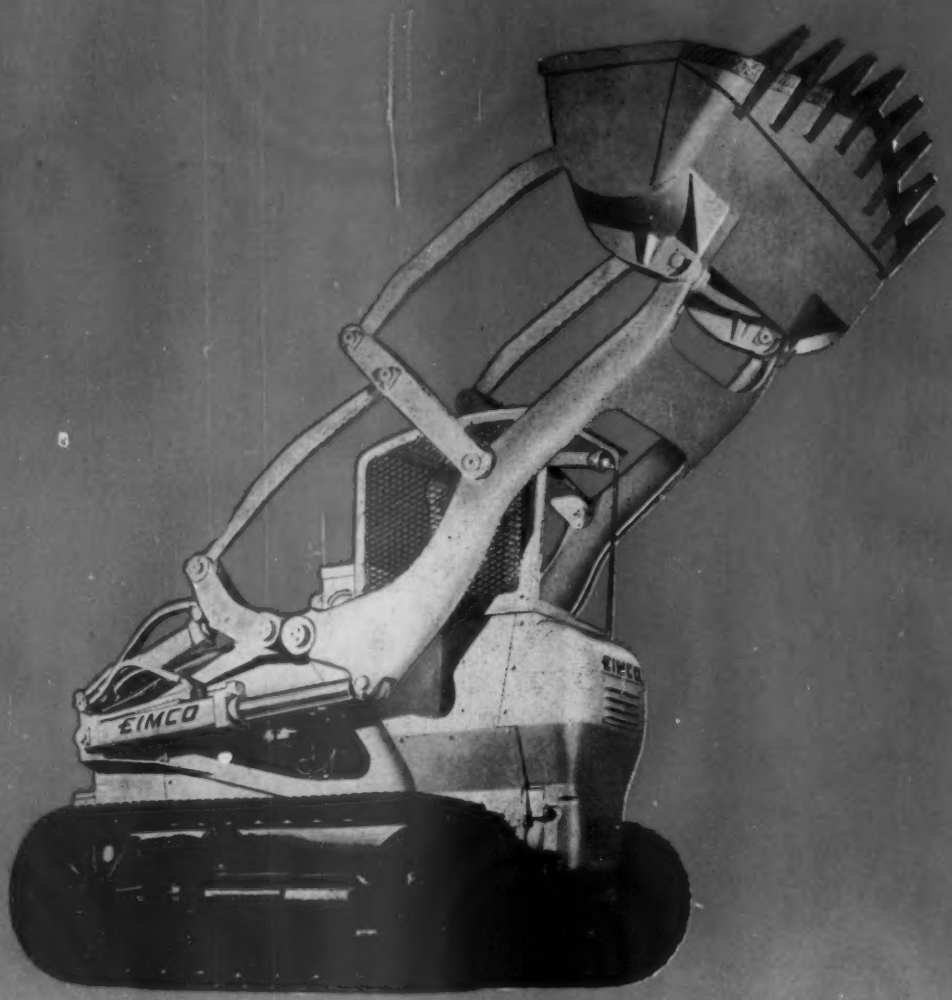

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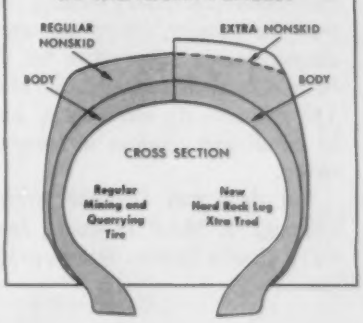

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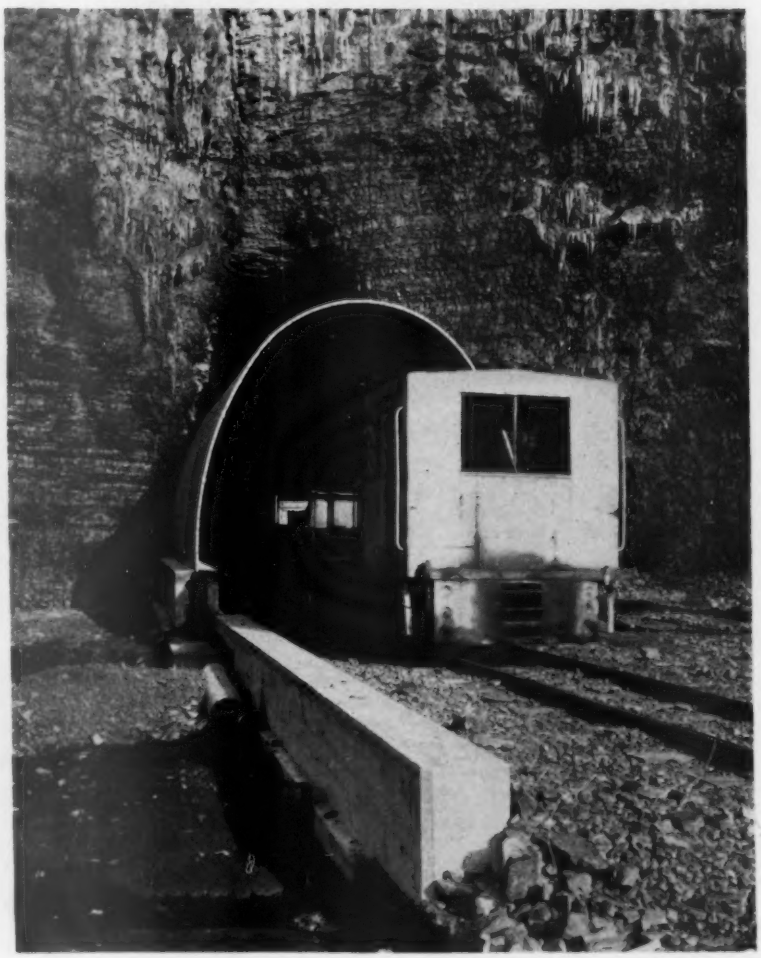

ARMCO Drainage & Metal Products

PIT and QUARRY

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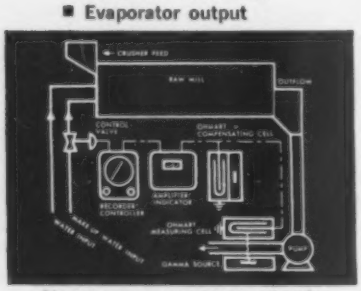

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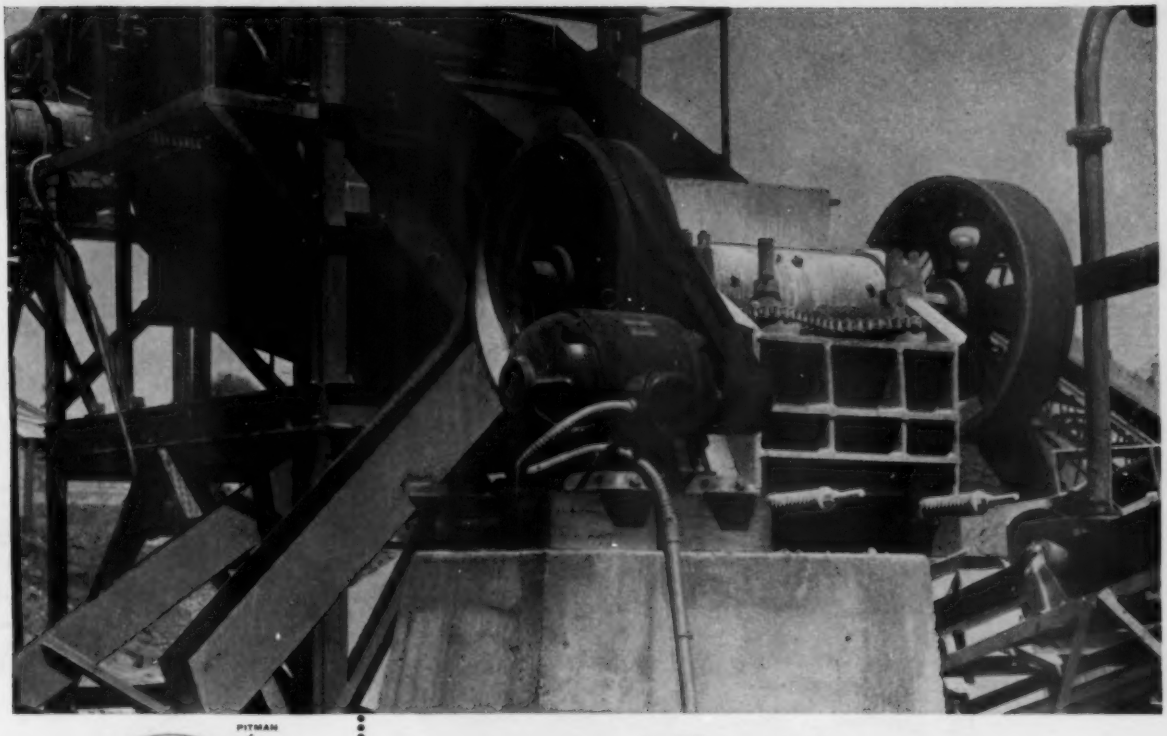

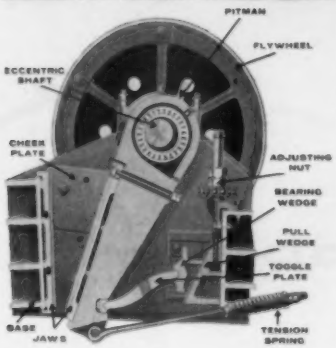

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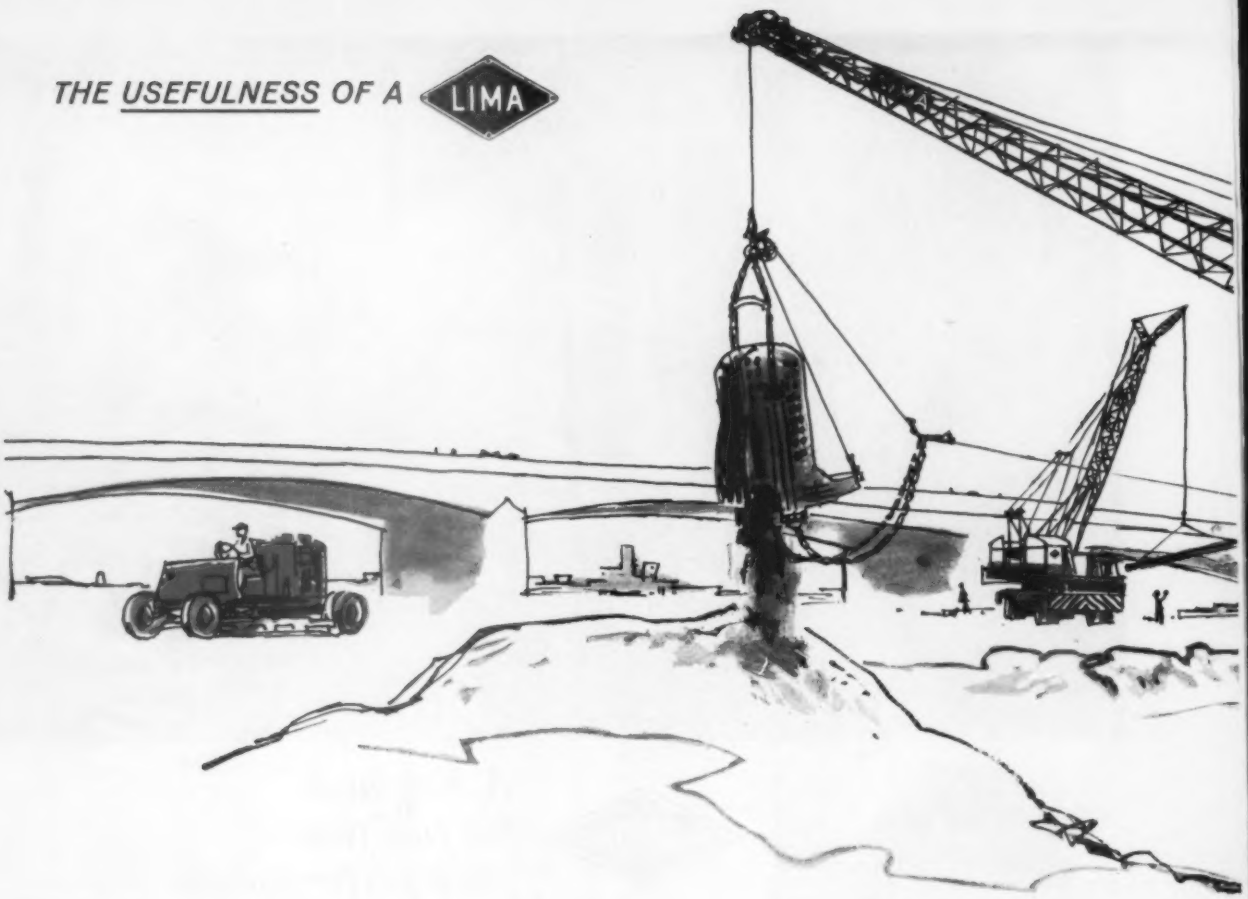

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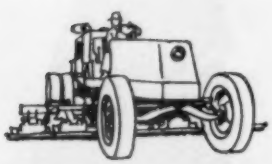

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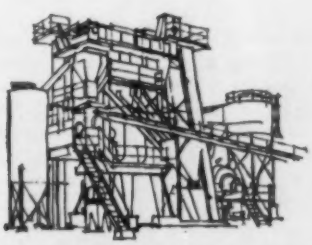

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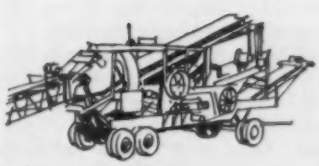

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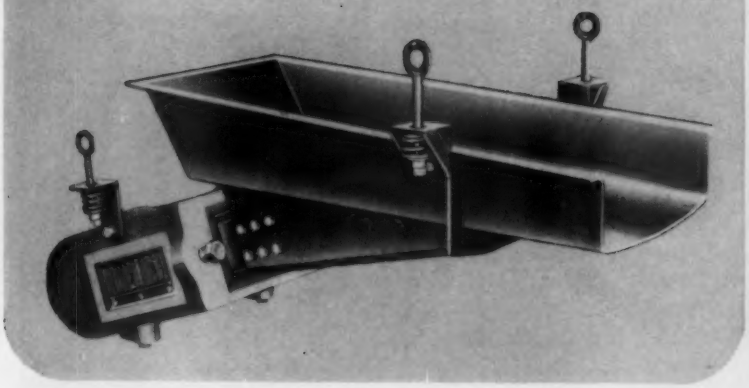

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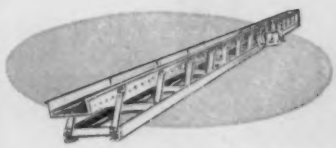

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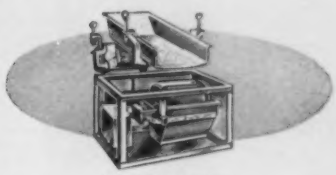

Gravimetric Feeders

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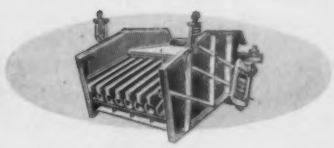
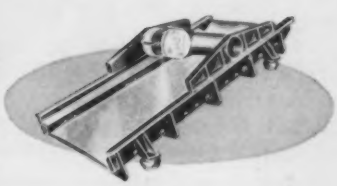


Grizzly Screens



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Washington News Letter

By S. HERBERT UNTERBERGER

ALTHOUGH most businessmen may not have noticed any improvement, the cautious optimism about the economic outlook which began in Washington with the inauguration of the Kennedy Administration has begun to turn buoyant. Indeed, some talk has been heard about how to control the inflation which will accompany the predicted boom.

N.B.E.R. Report When one looks for the evidence on which this rather extraordinary confidence is based, it turns out to be somewhat thin. First of all, there is the work of the National Bureau of Economic Research, a private economic research organization with an enviable reputation. The report of this group on business cycle indicators, which began many years ago, just happens to have been published in recent weeks.

This bureau has investigated some 800 statistical series, many of which it has processed in a variety of ways to yield more meaningful results, to ascertain the relationships between their behavior and the ups and downs of business cycles. From these, it has selected a dozen whose variations appear, over many business cycles, to have anticipated later movements in total business activity.

It has also selected a number of series whose variations appear to coincide with the movements in the economy as a whole, and a number whose variations lag behind. These two sets of series act as checks to confirm or refute the conclusions drawn from the "leading" indicators.

Of these 12 leading indicators, three have already reversed their direction; they are stock prices, liabilities of business failures, and industrial raw materials prices. Seven others appear to be leveling out and are just about ready to reverse themselves—industrial and commercial building contracts, new orders for durable goods, the hiring rate, the layoff rate, average hours of work per week, private non-farm housing starts, and changes in business inventories.

On the other hand, two are still going down—the net change in the number of operating businesses and corporate profits after taxes. Particularly, the behavior of the last raises some serious questions about the blithe conclusion that all is turning out for the best. If business profits continue to be low or nonexistent, there is serious doubt that prosperity can be regarded as having returned and that an improved level of employment can be long sustained.

Even the evidence provided by the leading indicators is still far from positive. It is too early to obtain any confirmation or repudiation from the later indicators. This is a rather weak foundation on which to base a prediction of an unprecedented boom to come.

Commerce Dept.-SEC Survey A somewhat better basis is found in the most recent regular survey made by the Department of Commerce and the Securities and Exchange Commission on planned business investments and sales expectations. According to that survey, the total expenditure on new plant and equipment in 1961 is expected to fall 3 percent short of the 1960 level; but the hopeful aspect is that a reversal of the trend is expected soon.

Effects of Many Factors This over-all trend is, however, the result of a combination of quite diverse trends in the various branches of industry. Thus, among manufacturers, those in the durable goods branch have shown a rapid decline in investment expenditures and are unlikely to show much of a recovery in 1961. On the other hand, among the nondurable goods manufacturers — particularly in petroleum, chemicals, foods, and beverages—there was very little decline; and a large rise is expected in 1961. Similarly, among nonmanufacturing businesses, the investments of those engaged in transportation have dropped and are not expected to recover in 1961, while the investments of electric and gas utilities have continued a steady upward movement.

While business investment is expected to decline by 3 percent from 1960 to 1961, manufacturers are expecting a 3 percent rise in sales. It is still problematical whether this will occur. Last year at the same time, an 8 percent rise in sales had been predicted. Nothing approaching this increase was realized. Further doubt is cast on the possibility of a significant sales rise in 1961 by the companion survey of consumer buying intentions made for the Federal Reserve Board.

Federal Reserve Board Survey That report states that early in 1961 the proportions of consumers planning to buy both new and used automobiles within the next six months were at about the same level as a year earlier. The hopeful sign is that this is better than the situation was in the latter half of 1960. The proportion reporting plans to buy major household appliances was substantially smaller than a year ago, and the number planning to buy houses was also lower than in January, 1960. Finally, this report showed that the proportion of families reporting a decline in income from a year earlier

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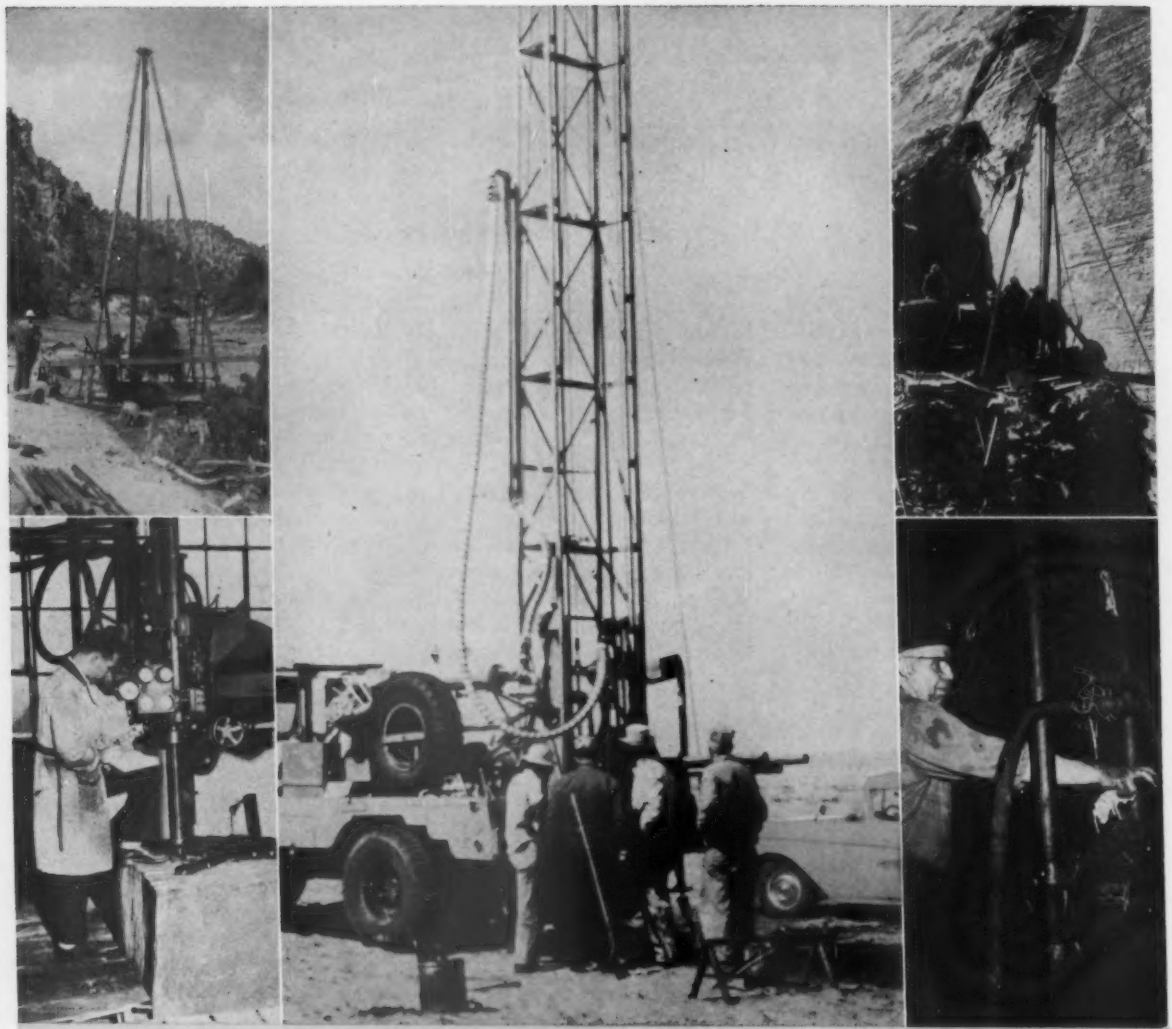

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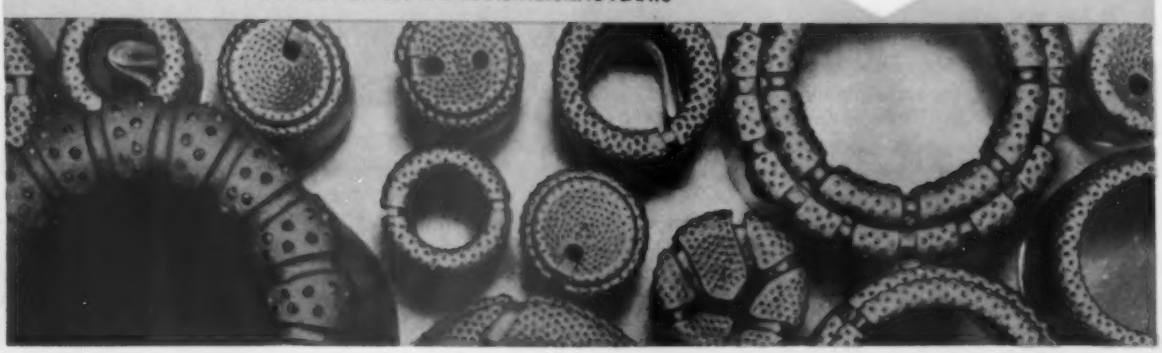

Labor Developments

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D.C.-Philadelphia, Pa.

THE Kennedy Administration, particularly its Labor Department under the leadership of Arthur Goldberg, formerly the labor movement's most outstanding lawyer, is determined to avoid long and costly strikes. It is also determined to avoid wage settlements with inflationary consequences because wages rise substantially more rapidly than output. This was also one of the goals of the Eisenhower Administration, which, however, it failed to achieve. The most conspicuous failure was the recent longest steel strike in history; it ended with the Administration's intervention resulting in a wage increase which clearly exceeded the increases achieved or likely to be achieved in productivity.

Why is there any reason to expect that Secretary Goldberg will succeed where his predecessor, Secretary Mitchell, failed? Secretary Goldberg is knowledgeable in the area, but Secretary Mitchell was certainly no neophyte, having come from a long and successful career as a labor relations official for a number of prominent companies in the New York area. Among these were Macy's and Bloomingdale's department stores, where labor relations are conducted in both an uninhibited and sophisticated manner.

The difference, if there will be one, will result from the fact that Secretary Goldberg is fashioning a machine to deal with the event well in advance of the time. Indeed, it is not a single device but rather a complex organization, designed to have both flexibility and strength. The title of the top body of the organization is the President's Advisory Committeee on Labor-Management Policy. But this is like the peak of an iceberg. It is the part that shows. The really large and powerful part is concealed well beneath the waterline.

No doubt, this Advisory Committee will hold meetings, listen to reports, and issue policy statements; but this is not its full function. Its principal value lies in the fact that it includes men who are likely to know what is stirring in labor-management affairs earlier than almost anyone else. It is also composed of men who can bring their influence to bear to change an undesirable trend or development before it becomes immutable.

By way of example, it includes Walter Reuther, president of the large and powerful United Automobile Workers union, which has often served as an innovating force in labor-management relationships. It was his union which recently made the first substantial breakthrough toward achieveing a guaranteed annual wage—or, at least, its first cousin, supplementary unemployment compensation benefits.

It is also this union which promises to create the earliest important strike problem to be faced by the Kennedy Administration when the U.A.W. contracts with the principal automobile manufacturers expire in the next few months. Certainly, the new Secretary of Labor is not so naive as to expect that Reuther will bring his problems to the Advisory Committee and abide by its decision. It will be far more reasonable to expect Reuther to try to use his membership on this committee as a lever for obtaining concessions which the auto companies are not willing to make voluntarily.

This, however, would be a risky act on Reuther's part, not only because Henry Ford II is also a member of the same Advisory Committee and would not permit such demands to go unchallenged, but even more importantly because other labor leaders of high stature are there. These persons include George Meany, president of the AFL-CIO; George Harrison, president of the Brotherhood of Railway Clerks; Joseph Keenan, president of the International Brotherhood of Electrical Workers; and David Dubinsky, president of the International Ladies Garment Workers Union.

If his plea falls on deaf ears in industry, this is more or less to be expected. But if it is met with less than ardent enthusiasm by his labor colleagues of equal stature because, among other things, they are not happy about the prospect of requiring their members, for example, to pay higher prices for their automobiles, it is quite another matter. It is a point which would seriously affect the popular support on which any union demand must ultimately rest if it is to succeed broadly.

Even after having run the gauntlet of his employer and union colleagues, Reuther would not yet have approached his goal. He would also have critical appraisal of such old pros in the field of labor-management relations as David Cole and Dr. George W. Taylor, who have presided over many an emergency board convened to investigate, prevent, and reduce strikes threatening the national interest.

The presence of Dr. Taylor furnishes substantial evidence of the "depth below the surface" of this committee. Not only is he one of the most knowledgeable of the experts becouse of his many years as a successful arbitrator in many of the nation's most important industries, including automobiles, and as the former vice-chairman and later

(*Concluded on page 77*)

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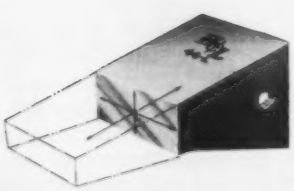

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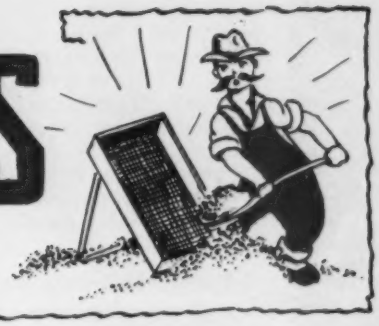
SCREENINGS



By RAY L. SMITH JR.

PERHAPS television is to blame for this age in which we live.

Either the "idiot box" or something else has conditioned the minds of people.

Everything must be a spectacular to have people-drawing power.

A chamber of Commerce meeting, locals have learned, is a flop unless an outstanding personage such as Jane Mansfield is on the program. And Janey is an outstanding, OUTSTANDING example.

Prescription

THERE'S NOTHING wrong with medical science when you consider for a moment some of the cure-alls developed by this group of dedicated men and women.

Still the medical profession is yet to come up with a cure for rheumatism.

It so happens there is a way to overcome this dread disease. A friend of ours deserves recognition for his perfection of relief.

Attacked sorely one morning with wracking pain of the arms and shoulders, said friend decided his shave would have to be assigned to a barber.

Sometime later he tromped out of the tonsorial parlor wearing an expression of determination.

"Barber shaves," he announced testily, "cost 65 cents. I'm sure I'll be able to shave myself from now on."

Potpourri and Succotash

She: "What's the difference between dancing and marching?"

He: "I don't know."

She: "I thought you didn't. Let's sit down."

A young housewife was giving her neighbor, an equally young housewife, some cooking instructions. "Then add five glubs of oil," she concluded.

"Five what?" she was asked.

"Glubs."

"What is a glub?"

"Oh, for heaven's sake!" said the instructor. "Tip the bottle until it says 'glub' five times."

A woman was riding in a taxi in New York City when the driver slowed up a little to miss a pedestrian. Apparently figuring that such unusual courtesy called for an explanation, he turned to her and said: "If you hit 'em, you've gotta fill out a report."

A farmer wrote to a veterinarian for free advice stating, "I have a horse that sometimes walks normally and at other times has a bad limp. What shall I do?"

The vet replied: "The next time he walks normally, sell him."

A neighbor woman had just given herself a new permanent. Two of her friends were discussing the job after she had gone home. "What do you think of it?" asked the first.

"Well, to me," said the second, "it looks like her pardon came just as the warden pulled the switch."

At a golf tournament, an official was surprised to catch the local pastor driving off about ten yards in front of the tee mark. He hesitated but fair play won out.

"I'm afraid, Father," he said, "you are disqualified. You just can't do that."

"I just can't do what?"

"Drive off from the ladies tee."

"My friend," said the pastor apologetically, "I'm playing my third stroke."

Talkative Barber: "Your hair seems to be turning gray."

Impatient Customer: "I'm not surprised. Can't you work a little faster?"

ODE TO A MARTINI DRINKER

Starkle, starkle, little twink
Who the Hell are you I think
I'm not under what they call
The alfluence of incohol
I'm not drunk as thinkle peek
I'm just a little slort of sheep
Tee martoonies make a guy
Fool so feelish, don't know why
Really don't know who's me yet
The drunker I stay the longer I get
So just once more to fill my cup
I'm all day sober to Sunday up.

Five men were ordering breakfast in a restaurant. "I'll have pancakes," said the first.

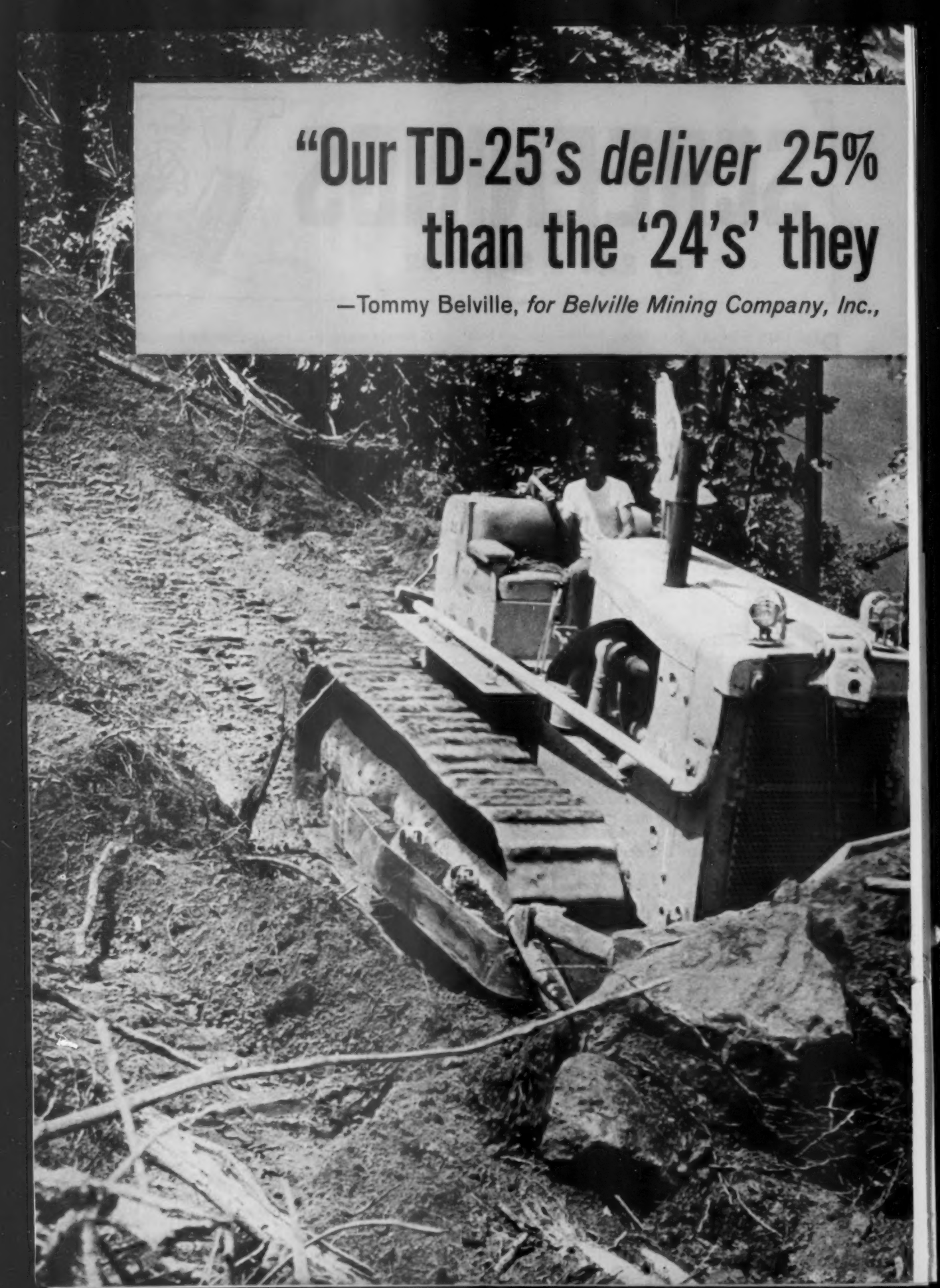
"Hot cakes," called the second.

"Griddle cakes," said the third.

"Wheat cakes," said the fourth.

"They're all synonyms, aren't they?" asked the fifth.

"No," replied the waitress, "but if you want synonym I can give you toast."



"Our TD-25's *deliver 25%* than the '24's' they

—Tommy Belville, *for Belville Mining Company, Inc.,*

more load replace"

Ironton, Ohio

"Our three International TD-25's are delivering 25% additional load, compared with previously-owned TD-24's," reports Belville Mining Company, Inc. "The TD-25 has more power to work at faster speeds without loss of motion.

"Another big advantage of the TD-25, mighty important in outcrop cutting, is you can back it up extreme grades at the faster speeds without changing gears."

"Belville" teams "25's" with a 7-cu yd dragline and a 2½-cu yd stripping shovel—to remove overburden as deep as 60 feet. The tractors are also used to level for the shovels, clean coal, construct roads.

"Live track" power-steering!

Like the TD-24, the TD-25 gives you exclusive "live track" Planet Power-steering—to make full-load, full-power turns, or slam straight ahead with offset loads. With combined on-the-go, HI-Lo power-shifting, you get instant, up-or-down matching of power to condition.

You turn with the dozer fully loaded, without spillage. You get constant-contact benching or highwalling, applying full power, getting full speed. You eliminate "dead-track drag" and "gear-shift lag."

With exclusive new International DT-817 Diesel engine wallop, the "25" bulls along, 230 turbocharged hp strong—without "slow-motion" lug-downs. New TD-25 seven-roller tracks are strength-matched to full engine effort. And the "25" is platformed on super-rugged double-box-beam frames to meet slam-bang conditions!

See what it means in extra profits to beat the famous TD-24 by 25% or more. Compare planet-drive "25" ability to outearn king-size clutch-steered rigs by amazing margins—clearing land, blading rock, benching, mass-production overburden removal. Let your International Construction Equipment Distributor demonstrate.

Benching an access road on a 1-to-1, or steeper, mountain slope. The operator of this Belville-owned TD-25 takes maximum advantage of "live track" Planet Power-steering—to gouge out stumps and boulders and cut shale—without "bank-nosing" or sluing. He simply operates the bank-side track in high-speed range, the other in low-speed range—for full-capacity, straight-ahead performance.

International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois

A COMPLETE POWER PACKAGE

Two of "Belville's" TD-25's remove up to 50% of the overburden from a coal seam—produce 25% more than the "24's" replaced. Only simplified TD-25 planetary design gives you "live track" power-steering and on-the-go power-shifting.

"When they told me this Cedarapids plant was designed to produce 200 – 250 tons per hour, it was no sales pitch!

WE AVERAGE 250 TPH OF 1½" MINUS REGULARLY"

It's no wonder Don M. Clark, owner of Clark Limestone Company, Logan, Iowa, is mighty well pleased with his Cedarapids Stationary Plant. When a plant produces *more* than its engineers say it will, that's extra money in the bank.

Mr. Clark also states, "We not only average 250 tons per hour, but quite often hit as high as 275. This plant was completely engineered for me by Cedarapids and those boys know their stuff. Maintenance is low and crushers and screens are well balanced."

Set up at Logan, Clark's plant is supplying aggregate for Iowa Interstate 29 between Council Bluffs and Missouri Valley. They are making five sizes of product to meet tough Interstate specifications:

Passing 1½"	100%
Passing 1"	60 to 90%
Passing ¾"	40 to 70%
Passing ⅜"	15 to 35%
Passing #4	0 to 5%

also making 4m x 8m chips and aglime

Clark's 100% Cedarapids Stationary Plant includes a 3645 Double Impeller Impact Breaker with Vibrating Grizzly and 36" x 14' Feeder, a 4033 Hammermill, three 48" x 12' Horizontal Vibrating Screens, and the necessary conveyors and bins.

Every aggregate producing job is different from any other . . . yet every job has one thing in common.

Each ton of finished product must be produced at the lowest possible cost to give you a satisfactory return on your equipment investment.

And lowest cost per ton is what you get with a Cedarapids engineered plant. Cedarapids maintains a special engineering department to "tailor" your stationary plant to your particular job conditions. Cedarapids engineers know rock. They know the equipment that will handle *your* rock most efficiently. They have a wide choice of components in the complete Cedarapids line, and they recommend not only the best type for your quarry conditions, but also the size that matches every other component in the plant for balanced production. They engineer extra tons of capacity into your plant and show you how to reduce maintenance and operating costs. Call in a Cedarapids engineer and be sure of getting lowest cost per ton. Your Cedarapid's Dealer will gladly give you details.

Cedarapids engineered for lowest cost per ton!

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa

Cedarapids
Built by IOWA

Gentlemen: Please send details about Cedarapids-Engineering assistance for my stationary plant operations.

Name_____

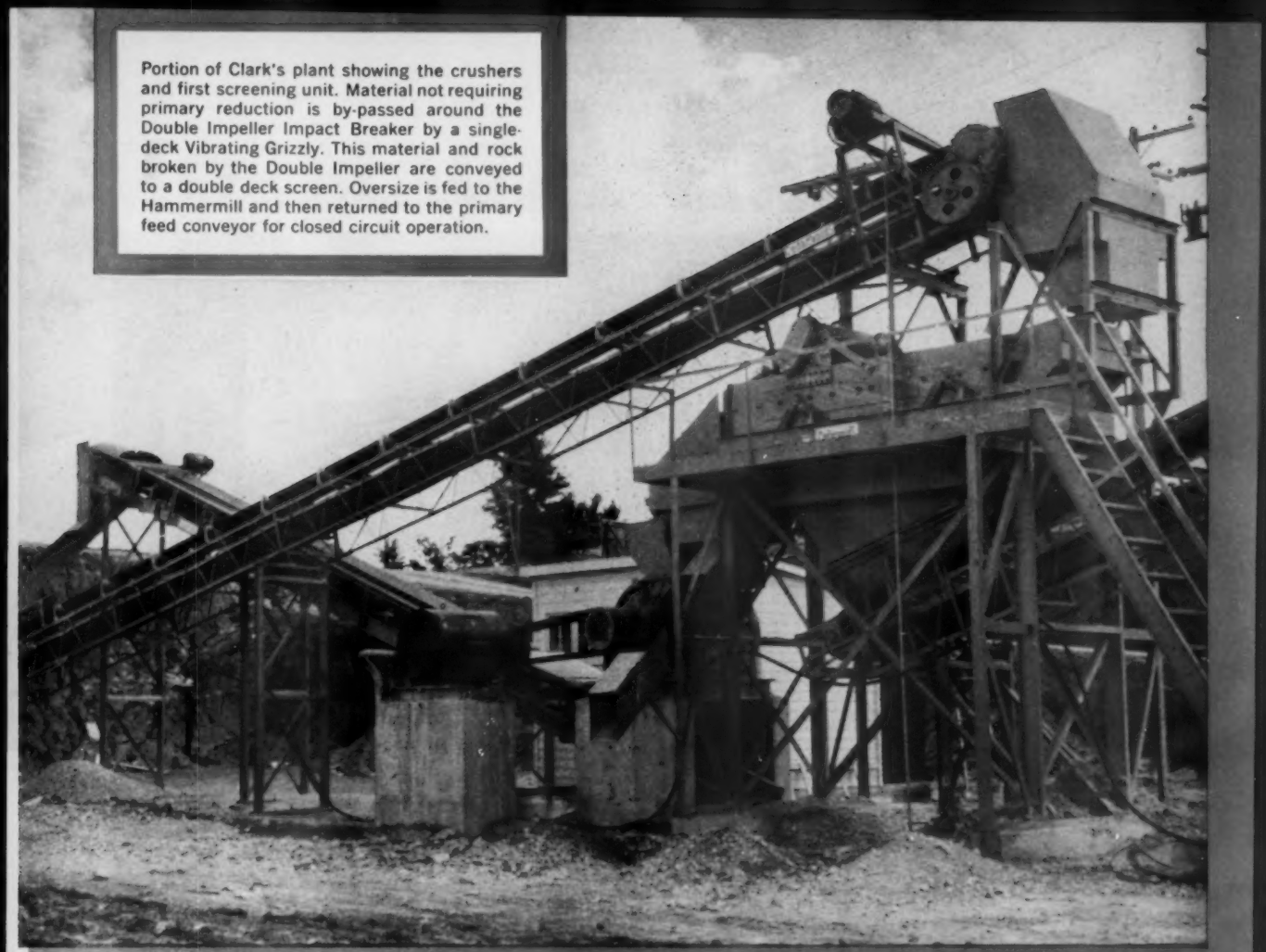
Company_____

Address_____

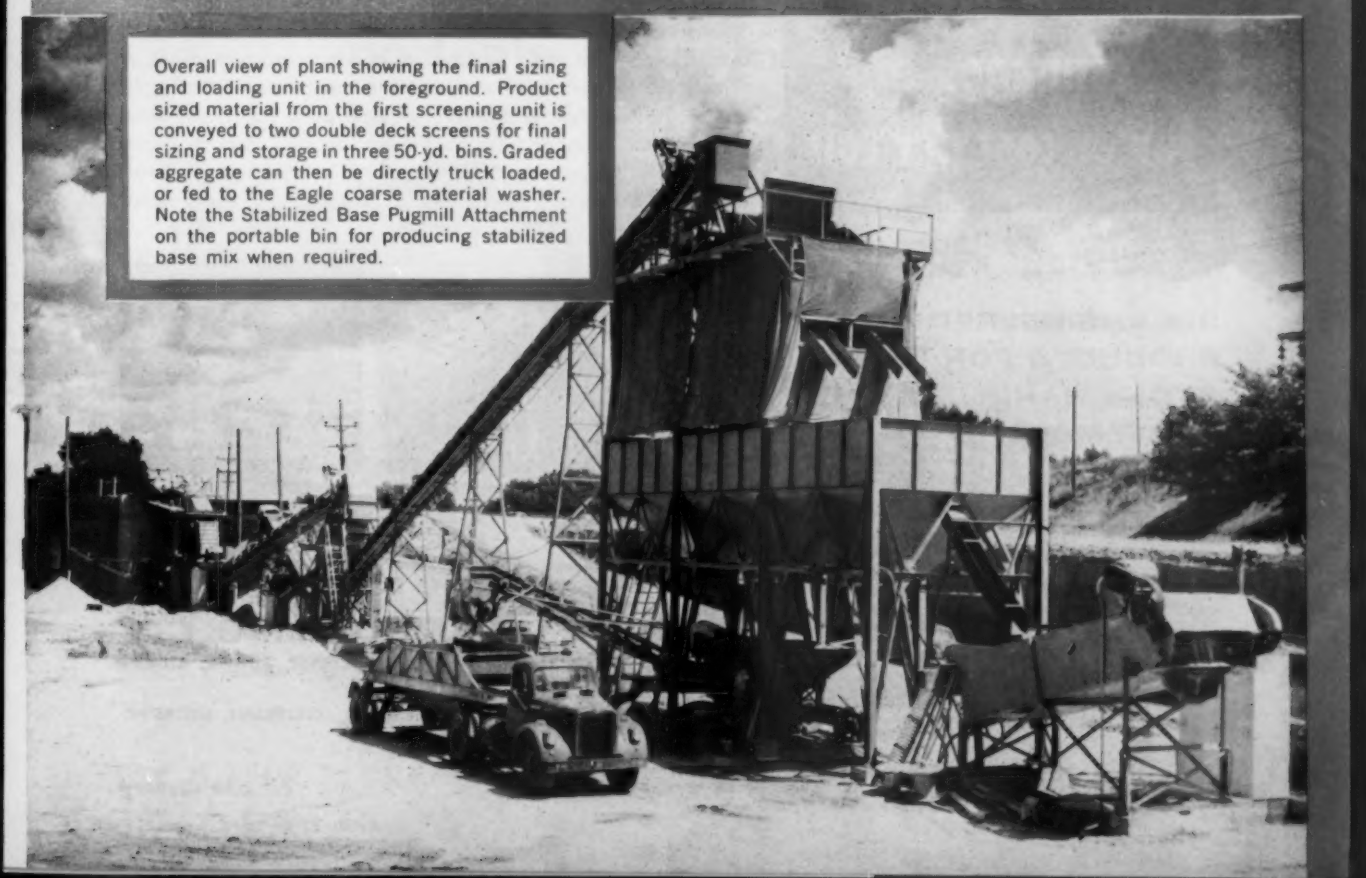
City_____ State_____

Send literature about: 5-760-RN

- ☐ Double Impeller Impact Breakers
- ☐ Jaw Crushers
- ☐ Roll Crushers
- ☐ Hammermills
- ☐ Horizontal Vibrating Screens
- ☐ Strigid Conveyors

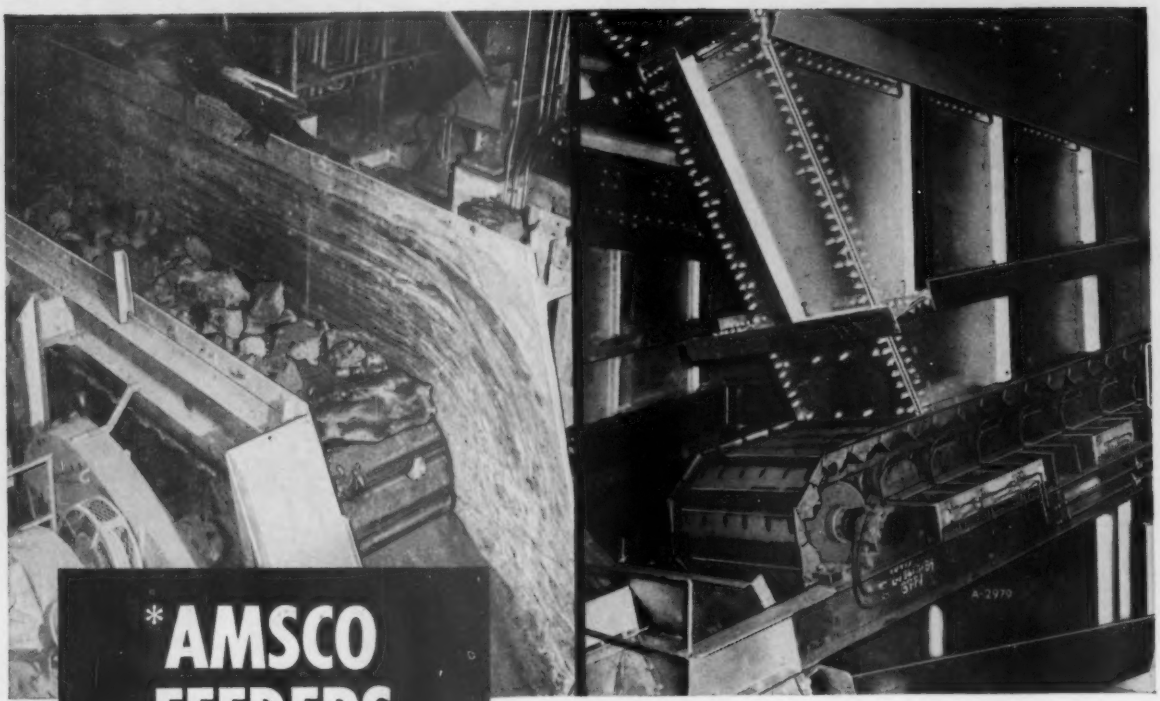


Portion of Clark's plant showing the crushers and first screening unit. Material not requiring primary reduction is by-passed around the Double Impeller Impact Breaker by a single-deck Vibrating Grizzly. This material and rock broken by the Double Impeller are conveyed to a double deck screen. Oversize is fed to the Hammermill and then returned to the primary feed conveyor for closed circuit operation.



Overall view of plant showing the final sizing and loading unit in the foreground. Product sized material from the first screening unit is conveyed to two double deck screens for final sizing and storage in three 50-yd. bins. Graded aggregate can then be directly truck loaded, or fed to the Eagle coarse material washer. Note the Stabilized Base Pugmill Attachment on the portable bin for producing stabilized base mix when required.

STEPHENS-ADAMSON



*AMSCO FEEDERS handle greater tonnages at lower cost per ton

Rugged S-A AMSCO Feeders take the impact delivered by thousands of tons of stone daily. Material flow from bins and hoppers can be accurately controlled up to 3000 T.P.H. and more. STEPHENS-ADAMSON AMSCO Feeders consist of a series of overlapping steel pans attached to endless conveyor chain. A wide range of pan styles are available depending on the application. AMSCO Feeder manganese steel pans and chain actually become tougher with continued use and impact. Many units are still in service after over thirty years of rough treatment. S-A builds a complete line of Feeders to fit every need.

*THE ROUGHER YOU TREAT 'EM . . .
THE TOUGHER THEY GET!
*Reg. T.M. American Manganese Steel Co.

S-A ENGINEERED PRODUCTS FOR STONE HANDLING SYSTEMS

BELT CONVEYORS—
REQUEST CATALOG DATA

BELT CONVEYOR STACKERS—
REQUEST CATALOG DATA

TUNNEL GATES—
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AMSCO FEEDERS—
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SEALMASTER® BALL BEARING UNITS
SPHERCO® BEARINGS & ROD ENDS

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STEPHENS-ADAMSON MFG. CO.

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PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
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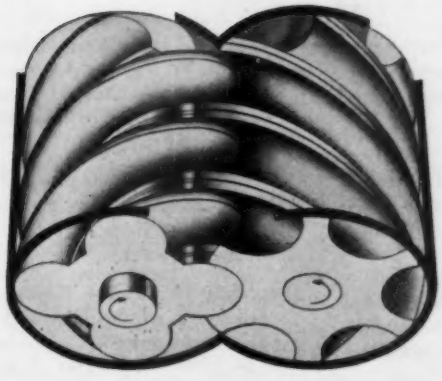
Here's the world's FIRST single-engine

1200 cfm

portable air compressor



ADVANCED DESIGN CYCLOIDAL COMPRESSION

This illustration shows the cycloidal rotor method of compressing air. As the lobes and grooves roll into each other, the mating pockets of air are joined and compressed. This design is similar to that of the Ingersoll-Rand Axi-compressor which has been in use for several years for stationary service. New refinements and design features make it ideally suited for large-capacity portable units.

Now, for the first time, you can meet your requirements for large blocks of air power with a compact, single-engine-driven compressor that's *truly portable.* For Ingersoll-Rand's advanced design 1200-cfm portable is no larger than a 900-cfm unit, and actually weighs 1000 pounds *less!*

Driven by a single General Motors 12V71 diesel engine, this new machine utilizes a compact, light weight cycloidal compressor with only two moving parts. It gives smooth, pulsation-free positive-displacement compression with a new high in capacity per pound of compressor weight.

Ask your Ingersoll-Rand engineer or distributor for complete information.

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THE WORLD'S MOST COMPREHENSIVE COMPRESSOR EXPERIENCE

News of the Industry

United States Gypsum Opens New Products Plant, Shaft Mine at Sperry, Iowa

With the formal opening of its new mine and plant at Sperry, Iowa, on March 29, the United States Gypsum Company has increased its capacity to serve a four-state area with enough wall and ceiling products for an estimated 40,000 houses annually.

The modern Sperry plant, the company's newest facility, is supplied with raw gypsum from a deposit 600 ft. below the surface. Installation of the latest in mining equipment assures a greater potential daily ore production in the Sperry shaft mine than at any other mine operated by the company.

Underground, the raw ore is transported by diesel-powered haulage units from the face to a crusher for primary reduction before it is skip-hoisted to the surface for storage and subsequent crushing and screening to mill feed size. The plant incorporates milling, calcining, mixing, board forming, and kiln equipment.

Products manufactured in the new facility include wallboard, sheathing, plaster base lath, and building products.

A high-quality gypsum sample from new United States Gypsum Company's mine at Sperry, Iowa, gets the once-over from Robert D. Stephen (left), U.S.G. vice-president of sales; Governor Norman A. Erbe of Iowa (center); and Hugh O. Jones, U.S.G. works manager.

$5 Million Expansion Set for Bessemer Limestone

The board of directors of Bessemer Limestone and Cement Company, Youngstown, Ohio, has authorized the preparation of engineering plans for a new secondary crushing plant and collateral equipment at its Bessemer, Pa., facilities. New raw and finish mills will be installed. Storage facilities for raw materials will also be constructed.

Under present plans, the crushing unit will be designed so the mills can service a second kiln if conditions should later justify this.

The expansion program will cost approximately $5,000,000.

Independent Gravel Company, Joplin, Mo., has purchased the Concrete Company, Carthage, Mo., from Cagle Equipment Company, for an undisclosed price.

Coming Events

May 11-13, 1961 — Point Clear, Ala. Annual convention, National Lime Association. Grand Hotel.

May 15-18, 1961—Cleveland. Convention and coal show, American Mining Congress. Public Auditorium.

June 11-15, 1961—New York City. 54th annual Air Pollution Control Association meeting. Hotel Commodore.

June 12-13, 1961 — Chicago. Mid-year meetings of divisional boards and committees, National Limestone Institute, Inc. Sheraton-Blackstone Hotel.

July 13-14, 1961—White Sulphur Springs, W. Va. Midyear meeting, National Crushed Stone Association board of directors. The Greenbrier.

July 20-21, 1961—Allentown, Pa. Midyear meeting, The Expanded Clay and Shale Association. Americus Hotel.

August 10-12, 1961 — Chicago. National Sand and Gravel Association Controllers' Conference. The Edgewater Beach Hotel.

August 20-24, 1961—White Sulphur Springs, W. Va. Semi-annual meeting, National Sand and Gravel Association board of directors. The Greenbrier.

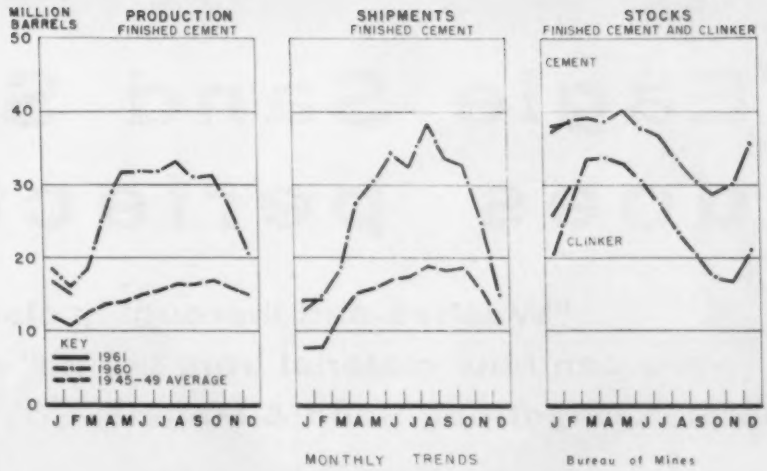
February Construction Shows Normal Increase From January Totals

The value of new construction put in place in March, 1961, amounted to $3.9 billion, according to preliminary estimates of the U. S. Department of Commerce. This amount was 8 percent more than in February (about the normal seasonal change between these months, and about the same as in March, 1960.

Cumulative value for new construction expenditures in the first three months of 1961 was estimated at $11.3 billion—virtually the same as the amount spent during the comparable period of 1960. While total private construction expenditures declined 5 percent to $8.1 billion, and private residential expenditures slipped 12 percent to $4.1 billion, total public construction expenditures increased 14 percent to $3.2 billion.

ITEMS: Private construction, estimated at $2.8 billion, was 7 percent greater than in February, and 4 percent less than in March, 1960. Residential was estimated at $1.4 billion—10 percent more than in February, but 11 percent below March, 1960.

ITEM: Public construction, estimated at $1.1 billion, increased by slightly less than the normal seasonal change from February. It was up 10 percent (the usual increase is 11 percent), and was also 13 percent above March, 1960.



— February, 1961, Finished Portland Cement —

SUMMARY—Production of finished portland cement in February, 1961, as reported to the U.S. Bureau of Mines, totaled 15,038,000 barrels—a decrease of 7 percent compared with February, 1960. Mill shipments totaled 14,351,000 barrels—a decrease of 2 percent compared with February, 1960. Stocks of 38,531,000 barrels of finished portland cement were nearly the same as those on hand February 29, 1960. Clinker production totaled 18,823,000 barrels—a decrease of 12 percent compared with February, 1960.

►PRODUCTION—One hundred and forty nine plants in 39 states and Puerto Rico reported a production of 15,038,000 barrels in February, 1961, compared with 16,080,000 barrels in February, 1960.

Production of clinker totaled 18,823,000 barrels, compared with 21,458,000 barrels in February, 1960.

High-early-strength portland cement totaled 948,000 barrels—a decrease of 15 percent from the 1,119,000 barrels produced in February, 1960.

Prepared masonry cement production of 783,000 barrels decreased 15 percent from the February, 1960, figure. Masonry cement data are reported in 280-lb. barrels.

►SHIPMENTS—Mill shipments of finished portland cement from one hundred and seventy-six plants totaled 14,351,000, compared with 14,576,000 barrels in February, 1960.

Shipments were higher in 13 districts and lower in 11 districts. The greatest increases were in the Minnesota-South Dakota-Nebraska, Oklahoma-Arkansas, and Kansas districts.

Shipments of high-early-strength totaled 767,000 barrels—a decrease of 20 percent from the 956,000 barrels shipped in February, 1960.

Shipments of prepared masonry cement totaled 930,000 barrels—a decrease of 6 percent from the 991,000 barrels shipped in February, 1960. Prepared masonry cements are shown in 280-lb. barrels, although they are sold in barrels of varying weights.

►STOCKS—Mill stocks of 38,531,000 barrels of finished portland cement were on hand February 28, 1961—almost the same as the 38,553 barrels on hand February 29, 1960. Stocks of clinker on hand on February 28, 1961, totaled 29,763,000 barrels—an increase of 9 percent over the 27,382,000 barrels on hand February 29, 1960.

►FIRST TWO MONTHS OF 1961—For the January-February period, the production volume of finished cement amounted to 31,782,000 bbl., compared with 34,749,000 bbl. in the 1960 two-month period. Total shipments for the first two months of 1961 are reported at 28,526,000 bbl.; in the same period of 1960 total shipments were 27,342,000 bbl. (Shipment figures do not include finished cement used in the manufacture of prepared masonry cement, as follows: February, 1960—122,000 bbl.; January-February, 1960—265,000 bbl.; February, 1961—96,000 bbl.; January-February, 1961—224,000 bbl.) ●

Lehigh Portland Cement Co. To Enlarge Board of Directors

Amendments to the bylaws of Lehigh Portland Cement Company have been made, permitting an expansion of the board of directors from six to seven members.

Four candidates have been nominated for election to the board: John B. M. Place, senior vice-president, Chase Manhattan Bank; Phillip H. Cooney, financial vice-president, Insurance Company of North America; Ralph L. Browning, executive vice-president, marketing, Lehigh Portland Cement; and, William J. Young, vice-president, administration, Lehigh Portland Cement.

The nominees will fill vacancies caused by board enlargement, the death of Raymond R. Bear and the decision of C. Glenn Browning and Robert A. Young not to run for re-election.

National Lime and Stone Co. Buys Ohio Producer

The plant and facilities of the Scioto Lime and Stone Company, Delaware, Ohio, have been sold to the National Lime and Stone Company, Findley, Ohio. Modernization of the Scioto plant equipment is planned.

National Lime and Stone was founded in 1903 at Carey. It presently operates 11 plants, producing agricultural and crushed limestone, fluxing stone, lime, and ready-mix.

The lime division of Scioto will continue to operate under Warford Reaney, president of that company, on a lease arrangement.

"Eagle Sand Section does perfect job"

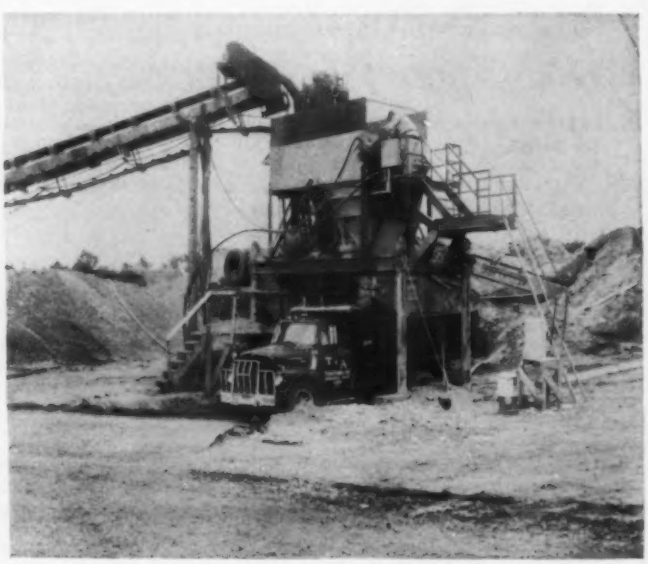
"Washes and thoroughly classifies as fast as we can haul material from the pit" says Jack Pilley, operator, Hagerman Sand & Material Co., Hagerman, N. M.

At right is shown the Eagle Sand Washing-Classifying-Dehydrating Section at the plant of Hagerman Sand & Material Co. Jack Pilley, operator, is pleased with its performance and finds a ready market for the controlled quality material produced. He finds the Eagle Sand Section simple and economical to operate.

It consists of a 20′ Water Scalping-Classifying Tank with snap-action electric-hydraulic bleeder valves, quick-adjusting metering splitter gates and 3-cell collecting-blending flume. One gradation of material flows from one cell of the flume to a 24″ x 25′ Single Screw Washer-Classifier-Dehydrator at right, which turns out mason sand, while an identical unit, at left, running at full speed, turns out concrete sand. A small amount of rejected material flows from the third cell of the 3-cell flume to waste.

No other combination of processing equipment can so economically and effectively control classification to give a producer the gradations that are needed and which can be profitably marketed—no other equipment for this job requires so little maintenance and costs so little to run. Eagle's vast experience assures you of getting your full measure of profit from the operation of Eagle Equipment. Send for your copy of **new** fact-filled 48-page Catalog 61.

get extra revenue with an Eagle Mixer!



an Eagle Mixer will mix a variety of road base and road surfacing materials right at your plant, for trucking to road jobs!

A number of producers are making extra money by providing various road base mixes to highway contractors, economically doing the mixing in an Eagle Portable, Self-Erecting Mixer. Easily hauled from site to site. Hydraulically raised to provide 9′ clearance for truck loading—quickly lowered. No ordinary pug mill, the Eagle is a heavy duty mixer with big wear-resistant Ni-Hard corrugated paddles that really blend and mix any combination of dry, wet, or viscous material for road base or road surfacing materials. Capacities from 125 to 900 t.p.h. Complete with power, drive, spray bars, flow meter and control valve. Low initial and operating cost. Auxiliary equipment available for adding cement, asphalt, calcium chloride or other additives. Also stationary models in 5 sizes. Unit shown is at Superior Stone Co., Div. of American-Marietta Co., Mebane, N.C. Send for Bulletin 1258.

EAGLE IRON WORKS

ENGINEERS • MANUFACTURERS

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EAGLE IRON WORKS

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● At the Grand Saline, Tex., mine of the Morton Salt Company, face and ceiling scaling has been simplified and expedited by means of an Ottawa Strato-Tower. This unit, equipped with a 45-ft. hydraulic boom tower and mounted on a 1½-ton Ford truck, is used after each shot to do the scaling. The equipment is positioned, the outriggers are lowered, and the tower is raised to the required height. Previously inaccessible heights are now easily scaled; the long reach of the unit permits scaling the 55-ft. high rooms now being developed.

$7,500,000 Expansion Scheduled By Arkansas Cement Corp.

A $7,500,000 expansion program is scheduled for the Foreman, Ark., plant of Arkansas Cement Corporation. It will double annual capacity of the wet-process mill, bringing its total to 2,800,000 bbl. a year.

The expansion will be financed under a new Arkansas law which allows cities to issue revenue bonds for industrial purposes.

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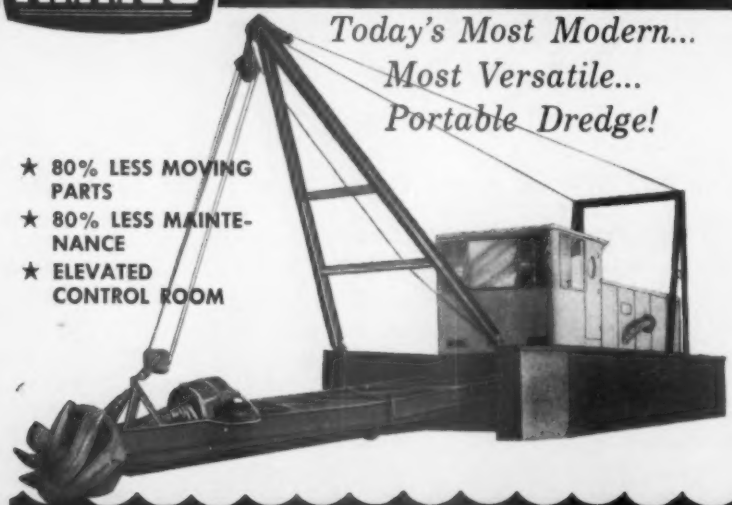
Today's Most Modern... Most Versatile... Portable Dredge!

★ 80% LESS MOVING PARTS
★ 80% LESS MAINTENANCE
★ ELEVATED CONTROL ROOM



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★ POWERFUL HYDRAULIC DRIVES ON CUTTERHEAD AND WINCHES

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$23,500,000 Expansion During 1961 Proposed For Marquette Cement Co.

Marquette Cement Manufacturing Company executives stated recently that $23,500,000 will be spent in 1961 for large-scale plant modernization, replacements, and improvements. It was indicated that operating cost savings from the extensive plant modernization work done in the last four years have helped maintain 1960 net income close to the 1959 level despite lower volume, higher wage rates, and increased material prices.

Among Marquette's major projects this year will be a complete rebuilding of the Catskill, N. Y., plant on the Hudson River. Output of this plant is sold by a subsidiary, North American Cement Corporation. As a part of this work, a new distribution plant will be erected on Long Island in metropolitan New York to provide low-cost barge and truck delivery of cement to the entire New York area. This plant will be supplied with cement by water from the Catskill production source, where a new cement loading dock is to begin functioning this summer. Capacity there will be increased 50 percent, to 2,500,000 bbl. of cement clinker annually.

Similar distribution facilities will be built within a two-year period at other seaboard locations in Massachusetts, Rhode Island, and Connecticut.

Work also will begin in 1961 on an $18,000,000 rebuilding program at the Neville Island plant on the Ohio River at Pittsburgh, Pa. This plant, operated by Marquette's wholly-owned subsidiary, Green Bag Cement Company, will have its clinker capacity expanded 95 percent, to 1,750,000 bbl. a year.

Less extensive but equally important modernization work will also be done this year at the Howes Cave, N. Y., and Security, Md., plants.

Plans have been announced for the midyear meeting of The Expanded Clay and Shale Association, Inc., which will be held on July 20 and 21 at the Americus Hotel in Allentown, Pa.

You spent $450,000,000 on bowling last year

13½ times as much as you gave to fight cancer

Shocking? Yes. And here's another shocking fact: in 1961, cancer will strike in approximately two out of three homes.

Go bowling. It's fun. Enjoy yourself. But when you spend fifty cents to knock down pins—give as much to the American Cancer Society—*to knock out cancer.*

If you do that, you will be giving $450,000,000 to fight cancer this year. *Thirteen and a half times as much as last year!* Fight cancer with a checkup—and a check to the **American Cancer Society.**

Citation for Pit and Quarry Among 1960 N.S.C. Awards

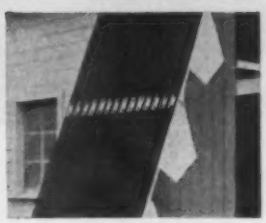
The National Safety Council recently announced the winners of its Public Interest Award for 1960. PIT AND QUARRY was again among the specialized magazines chosen to receive an award, which is presented for exceptional service to safety promotion by organizations in the mass communcations field.

Among the 57 publications in the specialized magazine group there were nine whose interests lay with nonmetallic mineral extraction and related industries.

As described by Howard Pyle, N.S.C. president, in announcing the winners, the awards are noncompetitive. Judges select those entries which indicate an outstanding effort in behalf of safety. The Public Interest Award was established in 1948 to recognize leadership, initiative, and originality in the mass media in the promotion of accident prevention.

SIMPLIFY YOUR BUCKET ELEVATOR SPLICING WITH . . .

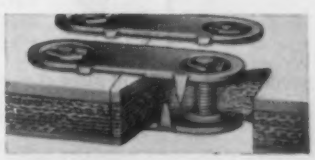
FLEXCO® BELT FASTENERS



Installation at Ready Mixed Concrete Co., 908 West 25th Street, Kansas City, Missouri.

PERFORMANCE YOU CAN DEPEND ON: The bucket elevator belt shown above, furnished by Republic Rubber Co. of Ohio, was installed in March, 1959 to replace a belt on which there were 9 repair lap joints. The FLEXCO splice pictured is the original installation. Only a negligible amount of take-up has been required since it was put in service. Belt has handled approximately 150,000-200,000 tons of sand and concrete stone.

PROTECT YOUR INVESTMENT IN CONVEYOR BELTS WITH FLEXCO . . . the quality fastener for all heavy-duty conveyor belt applications: SAND & GRAVEL, CRUSHED ROCK, CONSTRUCTION EQUIPMENT, COAL & METALS, ETC.



Cutaway of a FLEXCO application showing the compression plates, teeth and precision-made bolts and nuts.

Available in Steel, Monel, Stainless, Everdur. Also promal top plates.

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"FOR THE SPLICE OF A LIFETIME"

Flexible STEEL LACING COMPANY

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which lion has his teeth?

Both of these beasts have the heart of a lion. But, only one is feared in the jungle, for one is so old, he has lost his teeth.

Unfortunately, such is the case with replacement parts for crushers, tractors and shovels. Often parts produced by different manufacturers look alike, feel alike and weigh alike. But, when you put these parts to work, some, like the toothless lion, seem to chew with their gums. They do little work, and soon they are tired and worn out.

Why get caught with replacement parts that have no teeth, when you can play it safe with Columbia Armor-Tough replacement parts. Where rock meets metal, Columbia Armor-Tough parts are beefed up. Columbia manganese steel parts will do more work per dollar invested. Columbia guarantees it.

Next time order Columbia Armor-Tough replacement parts for crusher, shovel, tractor, and you too, will say, "Columbia out wears, out works all others."

Send for Columbia Field Report No. 504 telling how Columbia replacement parts outlived all others for De Atley and Overman, Idaho contractors.

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Death of Oscar E. Benson Mourned by Colleagues In Crushed Stone Industry

Industry associates throughout the country have joined the family, friends, and neighbors of Oscar E. Benson, late president of General

Oscar E. Benson

Crushed Stone, in mourning the untimely passing of this industry and civic leader on April 6, at the age of 62. Mr. Benson had headed the Easton, Pa., firm for ten years.

His industry colleagues named him to the top office of the National Crushed Stone Association in 1958, when he served as president of the organization. This had been preceded by his service on the group's executive committee.

When Mr. Benson entered the crushed stone industry, he brought with him a long background of experience in engineering and construction. After formal schooling in engineering came a position with the Empire Gas & Electric Company at Geneva, N. Y. Later promotions to the post of construction superintendent and then division operating superintendent culminated in a move to Easton, Pa., in 1942, as division manager for the Metropolitan Edison Co., which he later served as vice-president.

Mr. Benson resigned from the latter position in 1947 to begin his association with General Crushed Stone.

Enter 29 on card, page 217 →

Report from Bishop Sand and Gravel Co.—Mitchellville, Iowa

"OUR NEW 977H IS DOING A BETTER AND FASTER JOB THAN ANY OTHER MACHINE WE COULD HAVE USED...

"One of the reasons we get such good production is the power shift transmission. I think it's one of the best improvements ever put on a machine."
I. J. Bishop, Owner

The Bishop Company produces 1000 tons of sand and gravel a day. Their 977H excavates the gravel, feeds the screening plant and loads trucks. Occasionally, it's used for building levees, stripping overburden and general utility jobs.

This new 977H Traxcavator is a 2½ yd., 150 HP, tough, reliable machine that can handle about any excavation-loading job that comes along. It's designed to set a faster production pace than the model it replaces (and other makes of comparable size). With power shift transmission and live action hydraulics, it's the Traxcavator that never stops. It can take the roughest kind of work in stone quarries and gravel pits—move as much as 3 to 4 thousand tons a day.

Also built for tough pit and quarry work is the 955H—a 100 HP machine with 1¾ cu. yd. bucket and the same advanced features as the larger 977H.

Why not call your Caterpillar Dealer and arrange a demonstration? Put these machines against those you are now using and watch the difference.

NEW POWER SHIFT TRANSMISSION—one lever gives split-second changes in speed or direction to slash cycle time.

NEW LIVE ACTION HYDRAULICS provide faster lifting speed and greater lifting capacity without robbing power from tracks. The 977H packs 41% more hydraulic lifting force—955H, 37% more than former models.

NEW HEAVY-DUTY UNDERCARRIAGE has big D7 size track components, triple grouser shoes, lifetime lubricated rollers that need no servicing until rebuilding. Track guiding guards are welded to the roller frame for positive track alignment.

NEW DRY-TYPE AIR CLEANER removes 99.8% of all dirt from intake air even in worst dust conditions—cuts maintenance time as much as 75%.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

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TRAXCAVATORS ARE MAKING OTHER LOADERS OBSOLETE

Three Directors Named For Perlite Institute— Important Issues Studied

At the twelfth annual meeting of the Perlite Institute in Houston, Tex., on March 9, the following were elected as two-year board members: Jesse L. Maury, Atlantic Perlite Company, Washington, D.C.; Herbert T. Reynolds, Redco, Incorporated, Los Angeles; Neal Snyder, Combined Metals Reduction Company, Salt Lake City.

At the business session the annual progress report of the institute's program of activities was presented by the managing director. Committee chairmen also reported on the work of their groups on the technical, research, and marketing programs. Use of perlite in the construction, horticultural, and industrial fields was discussed.

During the afternoon session a talk was given by Edward Seaman Jr., F. W. Dodge Corporation, on the *Future Potential of the Construction Market*. Members of a panel were optimistic about the future potential growth of the perlite industries. *Turf Building with Perlite* was discussed by Dr. O. R. Lunt, University of California. P. A. Martinson, Johns-Manville Products Corporation covered the subject of *Expanded Fillers and Inert Pigment Extenders in the Paper and Paint industries.*

In this group picture, taken at the recent meeting of the Perlite Institute, Norman E. Braun, president of the organization, is fourth from the left in the front row.

A. J. Cayia of Inland Lime Succumbs at Manistique

Alfred J. Cayia, 68, who retired in 1957 as president of Inland Lime and Stone Company, division of Inland Steel Company, died at a hospital in Manistique, Mich., on April 3. (Inland Lime and Stone operates a plant at Port Inland, Mich.)

Mr. Cayia was also president of Caland Ore Company, Ltd., Atikokan, Ont., Canada. Before joining Inland Steel Company in 1928 he had been associated with M. A. Hanna Company, Cleveland, Ohio.

A. J. Cayia

For many years he was active in the affairs of the National Crushed Stone Association and had served as a director and also as a regional vice-president of this organization.

Feb. Construction Awards Total $2,235,367,000— Down 0.5% From Year Ago

In February, contracts for future construction in the United States dipped slightly below the comparable month last year despite a healthy 15 percent gain in most nonresidential types, according to F. W. Dodge Corporation. Total February contracts totaled $2,235,367,000—down less than 0.5 percent from February, 1960.

On a seasonally adjusted basis, the Dodge Index of construction contracts was reported at 239 in February (1947 - 49 = 100), compared with 273 in January, and the all-time high of 302 in December.

Heavy engineering contracts rose 1 percent; within this category, public works contracts dropped 5 percent, reflecting a fairly sharp decline in highway contracts which had been particularly strong in recent months.

Residential building contracts were down from February, 1960.

A summary of the latest figures follows:

	February, 1961	February, 1960	% Change
Nonresidential bldg.	$ 804,427,000	$ 697,501,000	+15%
Residential bldg.	869,892,000	987,577,000	—12%
Heavy engineering	561,048,000	554,456,000	+ 1%
Total construction	$2,235,367,000	$2,239,534,000	*
	2 Mo. 1961	2 Mo. 1960	% Change
Nonresidential bldg.	$1,615,735,000	$1,406,929,000	+ 8%
Residential bldg.	1,841,650,000	1,913,430,000	— 4%
Heavy engineering	1,257,379,000	1,018,890,000	+23%
Total construction	$4,714,764,000	$4,429,249,000	+ 6%

*down less than ½ of 1%

• Correction

In the pension plan case study appearing on page 118 of the April issue of PIT AND QUARRY, the second item was erroneously given This line should have read as follows: *Estimated tax credit at 52% . . . $6,240.*

completely

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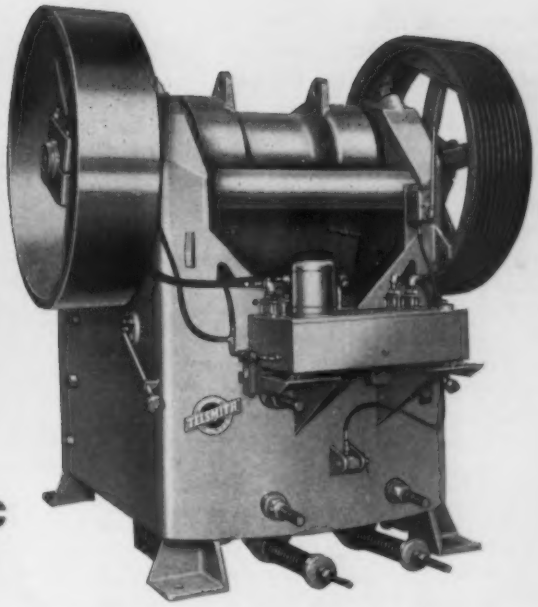
AUTOMATIC OILING SYSTEM



Available as optional equipment on 30" x 42" and 42" x 48" sizes

- *bearings last longer*
- *lube costs go down*
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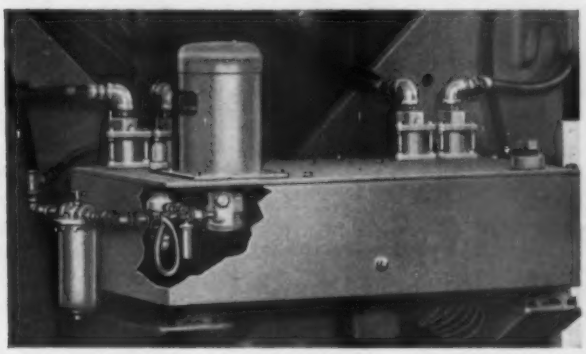

the ODDS are 80 to 1 in your favor

Now under severest abrasive dust conditions Telsmith Jaw Crushers run cooler at full capacity with oil changes every 4 months and *no time out for lubrication in between.* From 80 grease jobs to 1 oil change! More vital, you automatically end bearing failure due to improper lubrication. Filter-fresh oil in correct quantities circulates automatically, greatly prolongs bearing life, improves crusher performance. Find out why and how this newest jaw crusher development will save you many times its cost. Ask your Telsmith distributor.

HOW THE SYSTEM WORKS

Oil is pumped through the filter into crusher bearings and returns to the reservoir through flexible hoses. The pressure by-pass serves to insure a flow of constant pressure to the bearings and the temperature sensing device sounds an alarm if the oil temperature exceeds an acceptable limit.

The pressure-temperature control switch is mounted on the bottom of the tank for easy access. The tank can also be fitted with heating elements for cold weather starting. *Send for Bulletin 280.*

J-4-361

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Eastern Lime Corporation Buys Concrete Firms In Diversification Move

Eastern Lime Corporation, Kutztown, Pa., will diversify into the building materials field through the purchase of Lehigh Building Block Company, Allentown, Pa., and two affiliated enterprises which manufacture concrete block.

The company has also expanded its commercial operations through the recent purchase of the Whitehall quarry, near Allentown. New quarrying equipment and an asphalt plant now being installed will give the quarry a capacity of 2,000 t.p.d. of commercial stone.

The Lehigh group of concerns (which also produce drain pipe) will serve as an additional outlet for the company's commercial stone output.

Farrar of Cyanamid Honored At Convention of N.L.I

E. C. Farrar of explosives and mining chemicals department, American Cyanamid Company, Bound Brook, N. J., was cited for distinguished service by the National Limestone Institute at its 16th annual convention, held recently in Washington, D. C.

Mr. Farrar was presented with a plaque in recognition of his distinguished service as chairman of the Manufacturers' Division for the years 1954-55. He was instrumental in founding the division in 1954, served as its first chairman, and was a director of both N.L.I. and the division from 1954 through 1957.

Mr. Farrar has been associated with Cyanamid's explosives department since 1935. He was eastern regional manager for explosives sales until January of this year, when he was appointed assistant to the manager of the explosives and mining chemicals department.

E. C. Farrar of Cyanamid's Explosives and Mining Chemicals Department receiving the distinguished service award presented to him by the National Limestone Institute.

First Workshop Held To Plan Highway Week

Plans have been made for a long-range co-operative Better Highways campaign, and for the launching of the first National Highway Week during May 21-27 as a result of a resolution recently passed by the House of Representatives. President Kennedy will issue a proclamation calling for the observance of the week.

Drafting of the observance plans was done at the First Annual Public Understanding Workshop, which was held recently in Washington, sponsored jointly by the Better Highways Information Foundation and the American Association of State Highway Officials. The conference was a step to co-ordinate B.H.I.F.'s newly-launched public education campaign with the information programs of state highway departments. Thirty state public information officers from 28 states, 19 delegates from state Good Roads groups associated with B.H.I.F., and 27 highway industry representatives participated in the workshop.

$1,000,000 Glass-Bag Project Under Way at Riverside Cement

Construction began recently at the Oro Grande (Calif.) plant of Riverside Cement Company on the installation of five glass-bag dust collection units, one for each kiln. Total cost is estimated at nearly $1,000,000.

Present dust collection equipment consists of electrostatic precipitators. Addition of the new equipment brings the amount spent by the firm in air pollution control at this plant to over $2,000,000.

Lichtinger Heads C.I.M.A., Seven Directors Elected At Board Meeting

Arthur J. Lichtinger, executive vice-president of The Wellman Engineering Company, was elected president of the Construction Industry Manufacturers Association (C.I.M.A.) on March 6.

A. J. Lichtinger

C.I.M.A., which has headquarters in Chicago, is the only manufacturers organization whose entire efforts are devoted to the interests of the construction industry.

Officers chosen, in addition to Mr. Lichtinger, are the following: 1st vice-president, Buel M. Wallis, vice-president and director of marketing, Schield Bantam Co., Waverly, Iowa; 2nd vice-president, Robert E. Hunter, general sales manager, Detroit Diesel Engine Div., GM, Detroit, Mich.; treasurer, Ray McLean, president, The Jaeger Machine Co., Columbus, Ohio; and secretary, R. P. McKenrick, executive director, C.I.M.A., Chicago.

Seven new directors were elected to serve on the C.I.M.A. board for three-year terms: Robert B. Bradley, International Harvester Co.; D. J. Davis, Gar Wood Industries, Inc.; Thomas F. Flood, Galion Iron Works & Mfg. Co.; Kenneth P. Kerr, Butler Bin Co.; Clarence E. Killebrew, Clark Equipment Co.; C. B. Laird, Eagle Iron Works; and Ray McLean, The Jaeger Machine Co.

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MORE JOB VERSATILITY ◦ LOWER OPERATING COSTS ◦ WITH THE 'EUC' C-6

EUCLID C-6 LOWEST COST

Saves time and labor . . .

Job proved components and unsurpassed accessibility for day-to-day maintenance, as well as major repair work, keep downtime and operating costs to an absolute minimum. There's a big difference between the C-6 and its closest competitor . . . for example:

Service accessibility . . .

Fast, easy access to major components cuts repair and replacement labor.

- ***save 7 hours on radiator replacement***
- ***change a drive sprocket 5 hours faster***
- ***17 hours saved on recoil system replacement***
- ***engine replacement in 6 hours less***

These are typical times for removal and replacement without the prior removal of any integral components . . . think what these savings in time and labor can mean in lower operating costs and increased productive work time!

Power train . . .

Proven components . . . GM 6-71 engine, Allison Torqmatic Drive and Euclid planetary final drive . . . dependable, efficient and balanced, it delivers more of the rated engine horsepower to the drive sprocket than any comparable power train . . . and parts and service are readily available to owners everywhere!

Lower cost engine parts . . .

Individual engine parts, such as pistons, rings, liners and connecting rods, are up to 72% less in cost than for more limited production engines . . . a fan-to-flywheel engine replacement costs only one-half to two-thirds as much in the C-6!

See a "EUC" C-6 at work and see the big difference that pays off in lower cost!

TRACTOR IN THE 200 H.P. CLASS
...and the most versatile, by far

DOES MORE WORK...and a better job on more kinds of work

Because the C-6 is the most versatile crawler in its class, it's a more productive tractor. Matched power train...full-power shift...fast-as-a-fox response... better balance with any attachment... and easy operation... these are features that enable the C-6 to handle more work better and more efficiently.

When it comes to over-all productivity... on all kinds of tractor work... the "Euc" C-6 has earned a reputation for remarkable performance. Owners and operators alike report that it has more versatility and is more useful for a wide range of work from side sloping to the heaviest dozing and ripping.

You really have to see a C-6 at work to see what this versatile crawler can do in getting more work done... cutting costs and protecting your profits!

'EUC' C-6
VERSATILITY
CUTS CRAWLER COSTS

No other crawler in its class can do so many jobs so well at such low operating cost . . . no wonder this Euclid is the talk of crawler users everywhere!

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DIVISION OF GENERAL MOTORS, HUDSON, OHIO

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

Ontario Aggregates Producers Discuss Industry Problems

ALLAN T. LOWE, Commercial Sand and Gravel Co. Ltd., was recently elected president of the Aggregate Producers Association of Ontario at a meeting in the Seaway Hotel, Toronto. He succeeds W. B. Bennett, General Aggregates Limited, Oshawa, Ont. A national association seems likely to grow out of the Ontario group, say its officials.

One of the chief topics of discussion was the progress made on the association's effort to have a 25 cents per ton duty on Canadian aggregates entering the United States removed. No duty is imposed on American crushed limestone entering Canada.

Other efforts center around the use of new Canadian Standards Association standards for concrete and reinforced concrete and gradings for coarse aggregates. The association is working to have government bodies adopt the standards, and to approve new names for aggregate sizes.

T. C. Thompson, executive secretary, noted that in 1960, due to keener competition and a drop in home building and other types of construction, many companies took a closer look at their operations and improved their efficiency. He looks forward to a good year in 1961 with more housing, a larger highway program, and stepped-up installation of municipal services.

A. E. Field, P. Eng., transportation committee chairman, noted a "generally settled condition" in the trucking industry serving aggregate producers in 1960. More large tractor-trailers are being used.

Reduction in freight rates on aggregates moving into Toronto was a welcome move on the part of the railways, he said, and he advised members to look into shipping by water as well.

D. O. Robinson, chief engineer, Department of Sales, Canada Cement Company Ltd., the speaker at the dinner, reviewed some of the problems facing aggregate producers, and suggested an effort to standardize the materials now in use.

W. J. Cooke, chairman of the safety regulations committee of the Ready Mixed Concrete Association of Ontario, discussed safety rules and accident prevention in detail.

Allan Lowe (left), newly elected president of the Aggregate Producers Association of Ontario, is congratulated by W. B. Bennett, immediate past-president.

M. C. Miller Heads A.G.C. As President—Chairmen Named for Divisions

The recent convention of the Associated General Contractors, the 42nd annual meeting of the group, was held at Boston, Mass., from February 27 to March 2. Prominent speakers included Luther H. Hodges, Secretary of Commerce, and Governor J. A. Volpe of Massachusetts.

M. Clare Miller, San Ore Construction Co., McPherson, Kans., was elected president. The new vice-president is Frank F. Burrows, Williams and Burrows, Belmont, Calif.

New chairmen of the association's three divisions were also elected. Heading the building division is Fred W. Mast, Jens Olesen & Sons Construction Company, Waterloo, Iowa. The highway division chairman is R. W. McKinney, Nacogdoches, Tex.; and the chairman of the heavy, municipal, and utilities division is Carl M. Halvorson, Carl M. Halvorson, Inc., Portland, Oreg.

Lime Sold and Used in January, 1961

Lime sold and used in the United States during January, 1961 (908,919 short tons), increased in all categories compared with the previous month's output, according to reports released by producers to the U. S. Bureau of Mines.

Increases were reported in agricultural construction, chemical, and other industrial, and in refractory lime. Open market lime constitutes approximately two-thirds of the total lime reported; the remaining one-third is captive tonnage.

Lime Sold and Used by Producers[1] in the United States in Specified Periods of 1960-61, by Types and Major Uses in Short Tons

	November	December	January	
	1960	1960	1961	1960
By types:				
Quicklime	749,295[2]	707,250[2]	723,612	777,189
Hydrated lime	205,588[2]	174,093[2]	185,307	196,470
Total lime	954,883[2]	881,343[2]	908,919	973,659
By uses:				
Agricultural:				
Quicklime	4,219	2,875	2,375	2,198
Hydrated lime	3,679	2,753	3,754	4,170
Total	7,898	5,628	6,129	6,368
Construction:				
Quicklime	7,180[2]	4,684[2]	5,728	6,604
Hydrated lime	69,444[2]	48,527[2]	62,165	61,303
Total	76,624[2]	53,211[2]	67,893	67,907
Chemical and other industrial:				
Quicklime	621,602[2]	588,085[2]	596,993	539,447
Hydrated lime	132,465[2]	122,813[2]	119,388	130,997
Total	754,067[2]	710,898[2]	716,381	670,444
Refractory (dead-burned dolomite)	116,294	111,606	118,516	228,940

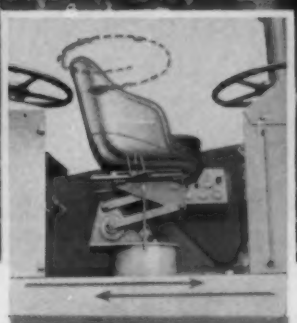
[1]The monthly canvass excludes the output of plants producing less than 10,000 tons a year. [2]Revised.

TIMED TO PROVE FASTER HAULING

On the job described here, a 15-ton Koehring 100 Dumptor was matched against another leading rear-dump hauling unit. The Dumptor out hauled its competition by an amazing margin — actual time studies (see table) showed the Dumptor making almost twice as many round trips! Why the big difference? One reason was that the competitive hauler had to back down the grade — as one observer said, "You could smell the brakes burning."

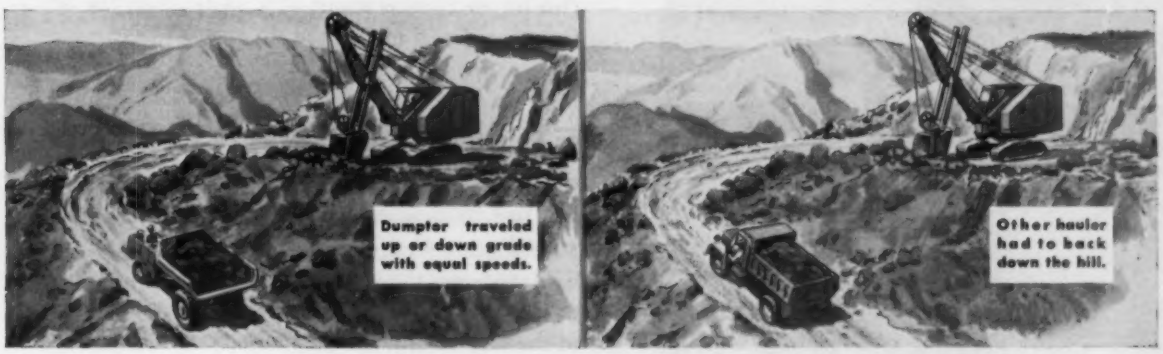
Check out the 100 Dumptor in your own operation. Here's a 30,000 lb. payload machine with a big 10′ x 10′9″ body. Instantaneous or controlled dumping. No turn operation. Full speed in both directions. Hydraulic clutches for direction and speed range selection combine with torque converter drive and power-steering for maximum operating ease and speed. Your Koehring distributor has all the facts. Call him for a demonstration.

HAUL UNIT	HAUL TIME			DUMP TIME			RETURN TIME			AVERAGE TRIP
TYPICAL TRIPS	#1	#2	#3	#1	#2	#3	#1	#2	#3	
15 TON DUMPTOR	:48	:53	:49	:07	:06	:04	:37	:43	:48	1 min. 38 sec.
18 TON REAR DUMP HAULER	1:25	2:00	1:53	:14	:16	:17	1:12	1:09	1:14	3 min. 13 sec.



Pivoting seat
2-way controls, full visibility in both directions. That's the key to faster hauling with the Dumptor!

MODEL 100 | 15-TON DUMPTOR



Test of Dumptor vs. rear dump hauling unit on job covering 603 feet total one-way haul with 204 feet of total distance on a 20% grade.

MORE WORK CAPACITY
MORE PROFIT PER DOLLAR INVESTED...

K14

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

What do you need

ROAD SPEED?

"With stockpiles of 9 different materials spaced along 3,000 ft. of river frontage, we needed fast road speed as well as fast loading of our own and other trucks. The H-90 PAYLOADER with travel speed up to 29 m.p.h. on top of its loading capacity answers our requirements — prevents truck tie-ups and time losses."

CARRY SPEED?

"One of the reasons we like our H-90 is because of its good carry speed. It's now averaging 1½ minutes per trip with 4-ton loads of sand on a 400-foot haul to build this stockpile, and we think that is pretty good. As the stockpile grows, the haul will increase to 600 feet."

LOADING SPEED?

"If we get crowded because we can't load the trucks fast enough, the boys (truck drivers) won't wait more than 5 minutes before going somewhere else. So we had to give them better and faster service. Our bigger H-90 is about 40% faster than the unit it replaced and makes the difference."

EASE of OPERATION?

"This H-120 is the fastest working big loader we ever had. Even with a 23-truck fleet on a short haul, I am waiting for trucks. I don't have to work very hard because it's a dream to operate — with its power controls, fast response and clear open vision of the bucket and the area all around the machine at all times."

PAYLOADER®

more than 20 models in 8 capacity ranges

Hough, Payloader, Paymover, Paylogger, Payloma tic and Pay are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

in a tractor-shovel?

VERSATILITY?

"Our H-90 gives good, efficient production on load-out work. It has adequate power to get top production without overloading the engine. The brakes are real good and it's economical on fuel. We use is for quarry clean-up, stockpile load-out and stripping overburden. It also has to load out the shot rock in emergencies."

RELIABILITY?

"We have enjoyed good performance ever since we started using PAYLOADER machines. Our present fleet consists of an HU, an H-70 and this new H-30. We have experienced continuous production and service with a minimum of repairs. Our operators appreciate the ease of operation and safety that are built into all our PAYLOADER units."

SAFETY?

"We purchased the H-50 for many reasons: The dependable service from our older Hough's, the no-spin differential for better traction, fast shifting, speedy operation. But most of all we like the greater operator safety over other makes . . . its better balance and excellent vision with no chances of operator getting caught in the lifting arms."

EASE of SERVICING?

"We like the H-90 real fine and bought it after several days demonstrations of two other makes. One thing we like about the Hough is the ease of servicing — a lot fewer grease points, more accessible, and faster and easier to take care of. The operators prefer the position of the levers in the Hough, too."

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY – INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
750 Sunnyside Avenue, Libertyville, Illinois
Send data on all PAYLOADER models.

Name _____
Title _____
Company _____
Street _____
City _____ State _____

5-B-3

A.E.D. Members Review Problems—Look Forward to Improvement

THROUGHOUT the 42nd annual meeting of the Associated Equipment Distributors, held February 5 to 9 at the hotels Statler and Biltmore in Los Angeles, the spotlight was thrown on the general economic slide experienced by the construction equipment industry during 1960.

Approximately 3,000 delegates representing about 900 manufacturing and distributing companies heard the group's 1960 president, H. J. Mayer (Western Machinery Co.) describe the year as "the most hectic, frustrating, and unprofitable . . . experienced for some time by distributors and manufacturers."

Oversupply, credit abuses, overstocked inventories, irresponsible leasing, inefficient management, and warranty misuses were mentioned as primary causes of many of the industry's difficulties. However, on an optimistic note, it was pointed out that a slight further decline during the first half of this year would probably be reversed by a recovery in the last six months.

This expectation was echoed by leading contractors, economists, manufacturers, and management consultants who addressed the convention, and by the delegates themselves. It was backed up by the anticipated 4 percent rise in over-all construction activity, and an expected slight increase in the Gross National Product.

A prominent contractor noted that the construction industry has led the way out of three recessions since World War II, and can be counted on to bolster the economy during the present dip.

The important factor of credit conditions was analyzed, and it was stated that these would be comparatively stable during the next few months, but that credit would probably become somewhat tighter as business activity expands later in the year. It was predicted that finance companies would have ample money, and that their rates would not change appreciably.

Some resolutions passed by the delegates during a business session reveal the temper of the industry. In one, it was resolved to renew efforts toward securing passage of the Curtis, Ikard, and Sparkman bills, offering tax adjustments on capital added to small businesses. Another resolution called upon A.E.D. members to devote a portion of their time to governmental affairs, and to become personally acquainted with their representatives at all levels of government.

New officers were also elected during the convention. Named A.E.D.'s 43rd president was Richard F. Newlin (Newlin Machinery Corp., Kansas City, Kans.). Other top officers are: Braxton Blalock Jr. (Blalock Machinery & Equipment Co., Atlanta, Ga.), senior vice-president; John R. Borchert) Borchert-Ingersoll, Inc., St. Paul, Minn.), vice-president; W. H. Cornelius Jr. (The Cornelius Co., Albuquerque, N. M.), vice-president; G. E. Bernard (Laurion Equipment Co., Montreal, Canada), vice-president; and H. B. Benson (Road Builders Equipment Co., Memphis, Tenn.), treasurer P. D. Hermann is A.E.D.'s executive secretary.

A.E.D.'s 1961 executive committee and top officers include (l. to r.): P. D. Hermann, executive secretary; W. H. Cornelius Jr. (The Cornelius Co., Albuquerque, N. M.), vice-president; John R. Borchert (Borchert-Ingersoll, Inc., St. Paul, Minn.), vice-president; R. F. Newlin (Newlin Machinery Corp., Kansas City, Kans.), the new president; Braxton Blalock Jr. (Blalock Machinery & Equipment Co., Atlanta, Ga.), senior vice-president; George E. Bernard (Laurion Equipment, Ltd., Montreal, Can.), vice-president; and H. B. Benson (Road Builders Equipment Co., Memphis, Tenn.), treasurer.

International Experts to Meet For Air Pollution Control Talks

The 54th Annual Air Pollution Control Association Meeting will be held June 11-15 at the Hotel Commodore, New York City. Experts from major free countries (including Canada, Mexico, England, France, and West Germany) are expected to join the nation's leading air pollution control authorities for the five-day meeting.

The program will consist of an intensive review of all aspects of the nation's air pollution control problem. More than 70 technical papers on specific problems will be delivered in 18 sessions.

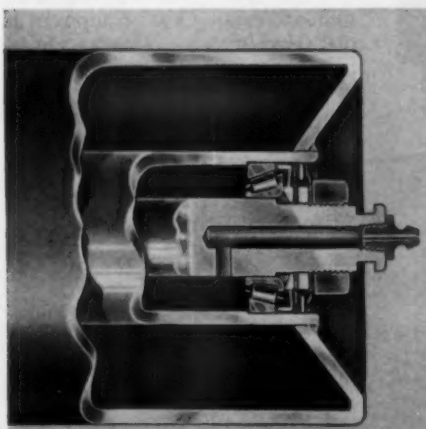
The Manufacturing Chemists Association will be joint sponsor of the keynote session, which will discuss standards. An all-day technical program dealing with instrumentation will be held under the joint sponsorship of the Instrument Society of America.

Lehigh Portland Cement company reopened its Iola, Kans., plant at the end of March; it had been closed since early December because its cement storage silos were filled. Increased shipments resulted in the reopening.

At the meeting of the Southern California Rock Products Association on March 28, the following officers were elected—president, Q. W. Best, Consolidated Rock Products Company; vice-president, John Kerfoot; and treasurer, M. L. Nash.

Today's best buy in Idlers...

broadest line of quality idlers at lowest price



HEAVY-DUTY IDLER FEATURES: exclusive combination nylon-and-metal face and labyrinth seal; tapered roller bearings; exclusive neoprene rubber "O" ring; material-shedding recessed roll ends; large capacity grease reservoir; and fittings that provide direct lubrication of each roll.

These are just a few of the Barber-Greene features that assure you of the most idler for your money:

- Broadest line—more than 800 different types and styles in four complete series, offering an idler exactly right for your conveyors.
- Larger bearings give longer service under most adverse conditions.
- Larger diameter, solid through-shafts of special high-alloy steel maintain roll alignment.
- Most advanced grease seals on the market assure maximum bearing life.
- Die-formed steel end and center brackets withstand far more punishment than malleable iron.
- Heavy self-shedding base angle ensures alignment, prevents material build-up under rolls.
- Rolls shells fabricated from heavy steel tubing of uniform wall thickness for even wear and balance.
- End cups 100% welded to roll shell forming sealed, rugged, extra-duty roll.
- Positive lubrication of each bearing prolongs bearing life.
- Rolls are interchangeable and readily replaced in stands.

See your Barber-Greene Distributor for today's best buy in idlers . . . or the most imaginative and economical design for your conveyor system.

Your belt conveyor equipment headquarters

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Other Plants: DeKalb, Milwaukee, Detroit, Canada, England, Brazil, Australia

CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

Aggressive Sales Policy Announced For Harnischfeger Corporation

ON MARCH 10 and 11 about 300 Harnischfeger dealers, executives, marketing and production officials, and representatives of the press attended a sales meeting called "Operation Survival," at Escanaba, Mich. The purpose of this gathering was to stimulate dealers into positive and aggressive action during a period when far too many companies are content to sit back and wait for the current economic recession to blow over. Complacency, it was pointed out, doesn't help sell equipment in a buyer's market. During such a period every distributor and member of the sales staff must put forth his greatest sales effort to retain his share of the available business.

It was pointed out by Jack Catalane, Harnischfeger's sales manager for the construction and mining equipment division, that new construction costing $58 billion has been forecast for 1961. This is a 5 percent increase over last year, and this industry is therefore one of the brightest spots in our present economy. Assurance was also given by Mr. Catalane at Escanaba that he intends to get his share of this market.

In order to impress upon the dealers the fact that there is a close bond between the manufacturer and themselves, each senior member of each dealer organization was given one share of Harnischfeger stock in the name of his dealership. This was done so that the 88 dealer organizations would receive copies of the company's financial reports, enabling them to know just how Harnischfeger is doing financially throughout the year. It is also hoped that this stock, although representing a negligible amount, will create a feeling of closer kinship between the producer and the dealer.

Walter Harnischfeger, chairman of the board, stressed the point that a company must make a profit to survive.

Henry Harnischfeger, president of the Harnischfeger Corporation, addressing the sales meeting in Escanaba.

During the two days of meetings a number of talks were made by various department heads and district sales managers of the Harnischfeger Corporation. These were supplemented by movies, slides, and charts. Talks were given by Henry Harnischfeger, president, and Walter Harnischfeger, chairman of the board, of the Harnischfeger Corporation.

A trip through the Harnischfeger truck-crane plant was a part of the program. It was here that two pieces of equipment were demonstrated. The first was a giant, vertical building crane, manufactured by Liebherr (Ireland), Ltd. Harnischfeger has a marketing agreement with this firm to sell these cranes in the United States. Also shown was a railroad adapter used to transport construction and maintenance cranes along railroad tracks. Other equipment in the Harnischfeger line, such as truck-cranes, shovels, backhoes, draglines, and electric welding sets were also on display.

LATEST CONSTRUCTION MACHINERY OF ALLIS-CHALMERS PREVIEWED

DEALER and press representatives from points throughout the United States and Canada, were recently treated to a "power parade" of construction machinery at a special showing held at its Springfield, Ill., plant by the Allis-Chalmers Manufacturing Company.

More than 50 Allis-Chalmers machinery units passed in review before approximately 1,000 persons seated in a grandstand. One of the highlights of the show was the unveiling of a new experimental dual engine motor scraper. Powered by two 340-hp. diesel engines front and rear, the earthmover has a re-

Approximately 1,000 visitors toured these grounds at Springfield, Ill., recently when Allis-Chalmers unveiled nine new models of its equipment.

ERIEZ *Magnetic Minute*

60 seconds that will help you improve operating efficiency.

CLOGGED BINS A PROBLEM?

If troublesome slowdowns caused by sticking, arching, stubborn materials are your problem, here's good news:

Eriez Hi-Vi® electro-permanent magnetic Unit (Bin) Vibrators are your answer. They've proven superior time and again for dependable movement of stubborn masses of granular, lumpy or powdered materials in bins or hoppers.

Their concentrated vibration is directed to deliver maximum efficiency precisely where it is needed. The full Hi-Vi line offers models for use with all sizes of bins with wall thickness to ½" — Special models are available for hazardous, dusty locations.

All models bring you these advantages.

- Direct AC operation — no need for rectifiers.
- Lower operating and maintenance costs.
- Compact, light-weight, easy to install.
- Weather-and-dust-resistant housings at no extra cost.
- No sliding or rotating parts.
- No wear, no lubrication.

Get the Hi-Vi unit that's exactly right for your operation. Full technical data is available in our new bulletin. Write for it to:

ERIEZ MANUFACTURING CO.
113SA Magnet Dr., Erie, Pa.

MAGNA-THOUGHT
The manufacturer who does the most for his customers is the one who is qualified to provide application know-how as well as superior products.

WM. H. BENSON
Supervisor Vibration Engineering

ERIEZ

A GROWTH COMPANY...
10 NEW PRODUCTS IN THE LAST 5 YEARS

Enter 45-A on card, page 217

ported capacity of 40 cu. yd. heaped. The all-hydraulic unit, now undergoing extensive tests, weighs 95,000 lb., and has a top speed of 30 m.p.h.

Other new models that drew the attention of the visitors included a 73,000-lb. HD-21G tractor shovel specially designed for steel mill slag removal, a medium-sized 105 hp. model 145-T motor grader, a TL-30 tractor loader with a lift capacity of 25,000 lb., and a new TS-160 motor scraper with a 13-ton carrying capacity.

Additional units on display were a redesigned HD-21 crawler tractor, the biggest in the Allis-Chalmers line; the new compact crawler tractor series, the H-3 gasoline and HD-3 diesel units, both in the 40 hp. class; and an HD-6 small crawler tractor; a new TS--360 motor scraper of 30-cu. yd. capacity. Visitors were also able to view the complete machinery line and exhibits on display in a huge tent. A tour of the firm's new service training center was also included.

In a display illustrating an application of the fuel cell power theory, reportedly pioneered by Allis-Chalmers, the dealers and press representatives witnessed a display depicting an application of this power theory, in which a model train was operated from the electrical energy created by the exotic experimental power source.

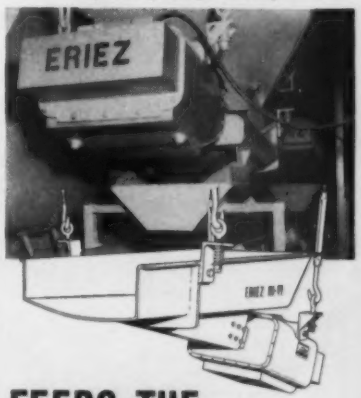
Through Ice, Snow and Dark— Marquette Quarrymen Serve

A few months ago, when winter's fiercest storm hit Earlham, Iowa, it picked on the hometown of nearly 20 Marquette Cement Manufacturing Company quarrymen. Freezing rains left the town without power and telephone, and a 16-in. snowfall didn't help.

Richard Waugh (quarry locomotive switchman) and Ralph Sloan (quarry foreman) came to the rescue. They rushed a pair of portable generators from the nearby quarry, hooking the units to the heating systems at a nursing home and another building where a number of people had gathered for shelter. "Operation Heat" continued throughout the night.

ERIEZ *Magnetic Minute*

60 seconds that will help you improve operating efficiency.



FEEDS THE BIG STUFF WITH ACCURATE CONTROL

PATENTED

AC powered Eriez Hi-Vi Vibratory Feeders move large tonnages of bulk materials with accurate control . . . more efficiently and economically. Illustration shows one of a number of Eriez units available for heavy feeding applications where **big capacity and accuracy** are essential.

Whatever your application, there is an Eriez electro-permanent magnetic feeder that will meet your exact needs. And you get this exclusive combination of advantages: No rectifier needed . . . AC operation. Totally enclosed drive element ideal for hazardous, dusty, wet and corrosive installations. New fibre glass springs assure superior performance and control . . . longer life because spring breakage is practically eliminated.

The full line of Eriez Hi-Vi vibratory feeders includes models with feeding capacities ranging from ounces to many tons per hour.

Write for descriptive bulletin to:

ERIEZ MANUFACTURING CO.
113SB Magna Drive, Erie, Pa.

MAGNA-THOUGHT
Constant research, development and refinement are the keys to new and improved products. New and improved products are the keys to a company's growth.

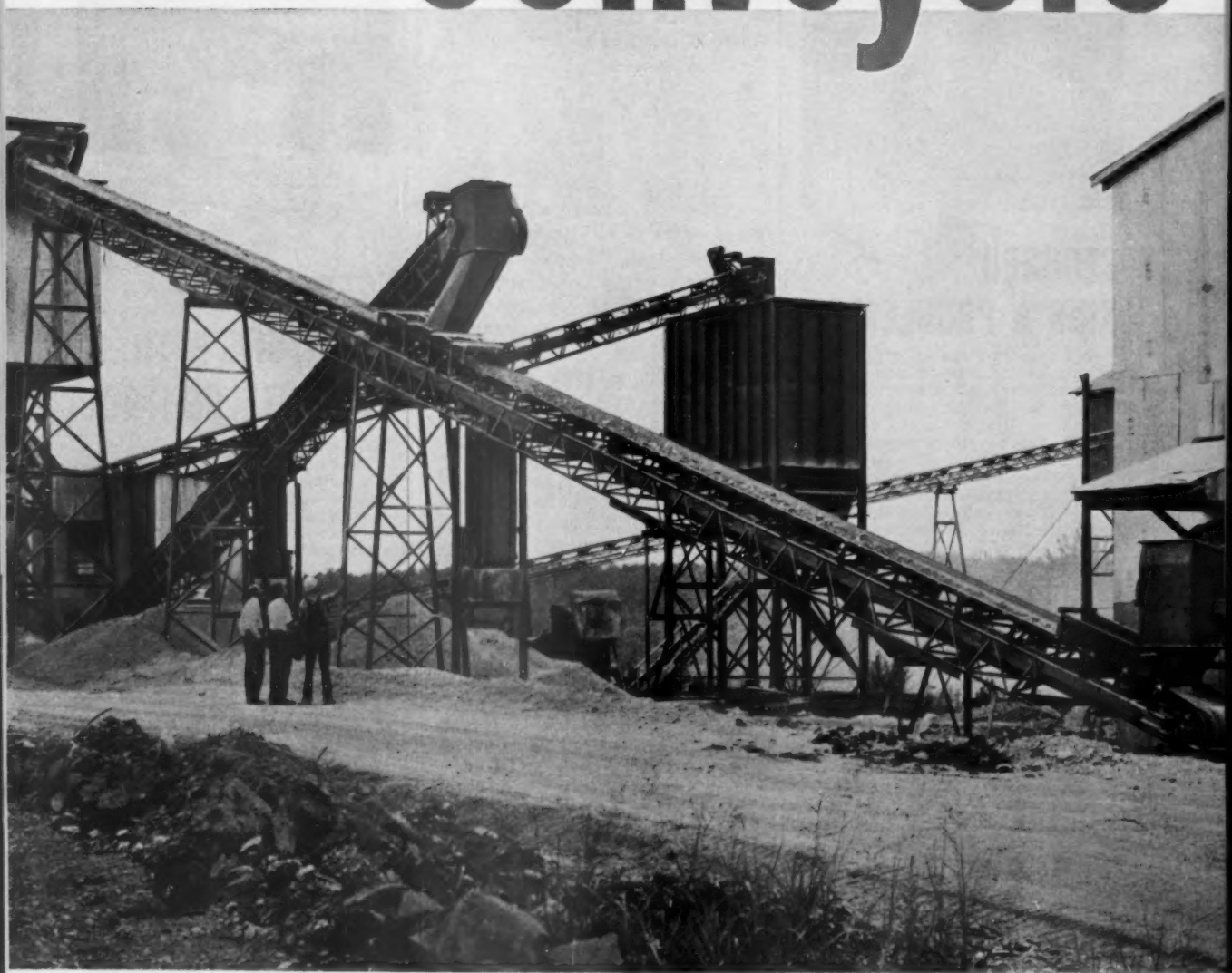
A. F. ISRAELSON
Chief Engineer

ERIEZ

A GROWTH COMPANY...
10 NEW PRODUCTS IN THE LAST 5 YEARS

Enter 45-B on card, page 217

LINK-BELT conveyors



PRE-BILT BELT CONVEYORS—A combination of pre-engineered and pre-selected standard components and structures, Link-Belt Pre-Bilt belt conveyors are designed to meet the requirements for a wide range of applications and operating conditions. Shop assembled components simplify field assembly, minimize erection time . . . resulting in low initial costs. *Job-Engineered* belt conveyors can be designed for small or large tonnage applications, for routes of any length.

The last word in value from the first name in conveyors

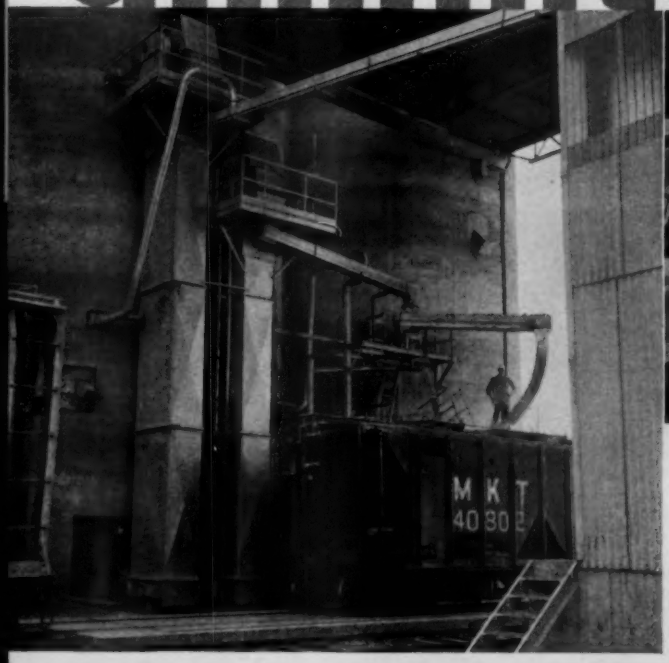
When it comes to your materials handling needs, it is a matter of sound economics to depend on Link-Belt, builders of industry's most complete conveyor line. In addition to this broad range of line, which permits unbiased recommendations, Link-Belt offers *quality*—achieved through engineering skills, manufacturing scope and research . . . *"experience unlimited"* in the materials handling field.

Also important, Link-Belt can provide *complete* handling systems . . . patterned exactly to your requirements with a background of more than 80 years of conveyor specialization. Our engineers are familiar with the particular handling needs of every industry. It's more than likely they have met—and solved—many problems similar to yours. We will design, equip and erect your entire installation . . . and accept full responsibility for its successful operation.

For full information—on single components or complete systems—large or small—contact your nearest Link-Belt office. Catalogs covering all conveyors are available on request.

unlimited

The line that means savings, whether handling raw materials or finished products



◀ **BUCKET ELEVATORS** — Unlimited solutions to vertical or inclined movement of a wide variety of materials — bulk or parts. Fourteen types in four basic designs are fabricated from Link-Belt designed and integrated components — factory aligned for low-cost installation, smooth performance.

▲ **OSCILLATING CONVEYORS**— Whether handling fines, granules or chunks, Link-Belt's four types of oscillating conveyors — Flexmount, Coilmount, Heavy-Duty Coilmount or Torqmount—provide surge-free movement of hot, wet or dry materials. All feature *full-time positive action*, yet operate as near to *natural frequency* as possible to minimize power requirements.

WASHING, DEWATERING AND CLASSIFYING EQUIPMENT—Link-Belt's sand, gravel and stone preparation equipment assures production of a high grade product . . . is flexible in operation to meet changing specification demands. Here, a Link-Belt Rotoscoop dewaters sand . . . produces a product dry enough to permit transportation by trucks or belt conveyors.

CHAIN CONVEYORS—Drag bulk materials along a trough or can carry the load directly on the chain. In Link-Belt's broad line of chains, there's a type and size to meet every conveying need . . . for light or heavy-duty service. All are built for long-life, low cost operation.

LINK-BELT

THE SYMBOL OF QUALITY — LINK-BELT

CONVEYING AND ELEVATING EQUIPMENT

Keeping production on the move in every industry

Apron conveyors
Arm and tray elevators
Belt conveyors
Bucket elevators
Bucket elevators-conveyors
Bucket wheel excavators
Bulk-Flo
Car-type conveyors
Chain conveyors
Circular carrier conveyors
Drag conveyors
Flight conveyors
Flite-Flo conveyors
Jetslingers
Oscillating conveyors
Power-and-free conveyors
Pusher chain conveyors
Scraper conveyors
Screw conveyors
Sidekar-Karrier conveyors
Skip hoists
Slat conveyors
Trolley conveyors
Trukveyors

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses and District Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs; Switzerland, Geneva. Representatives Throughout the World. 15.637

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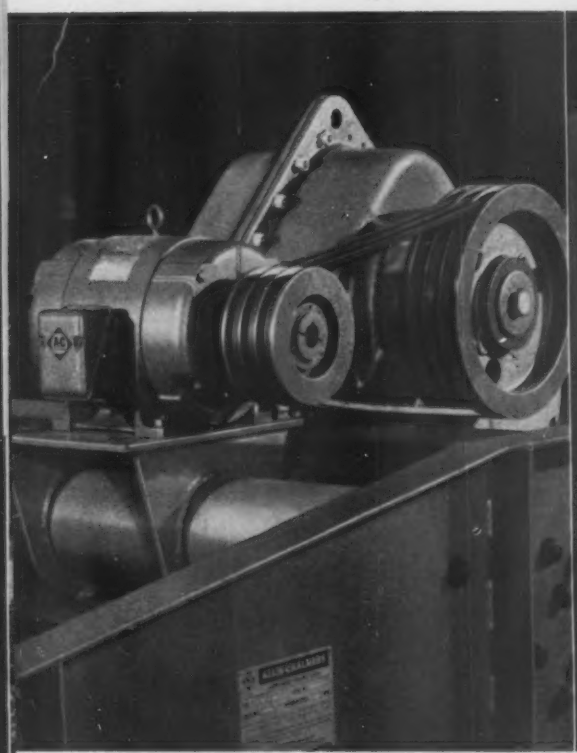
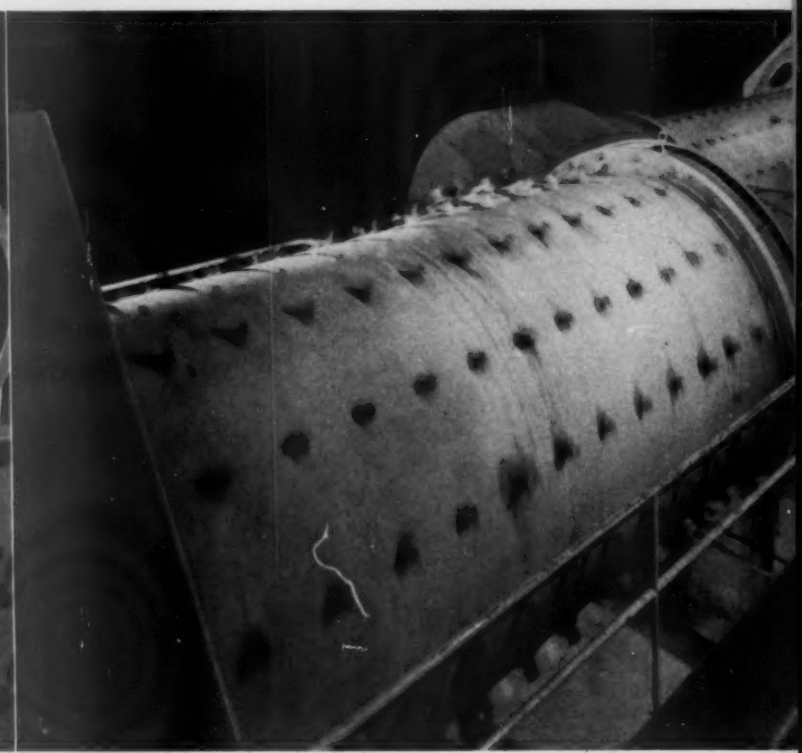
ideas and news:





Low-Head screen with direct mounted motor: A completely integrated screening unit is this new, LOW-HEAD horizontal screen with direct mounted motor. No supporting structure, no belt tensioning or alignment problems plus headroom saving, smooth starts and stops, easy accessibility for maintenance. Another example of engineered screening from Allis-Chalmers.

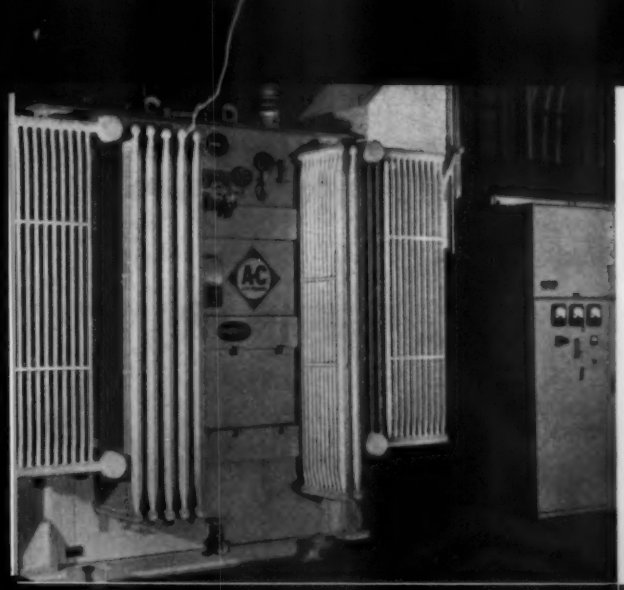
Rod mills debut in cement "society": Two Allis-Chalmers overflow rod mills are being used by a Michigan cement company to wet grind cement raw materials in open circuit. Several other cement companies too are using them — all report substantial savings in labor and power requirements and a more uniform product. Biggest advantage of rod milling is preparation of sized feed for the tube mill, permitting the BALLPEB mill to grind satisfactory rotary kiln feed in open circuit.

Which of these productive ideas could be working for you?

Screen with direct mounted motor. New ideas in kilns. Grinding mills that cut cement production costs. These examples demonstrate the extra value that is standard with A-C... the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Industries Group, Milwaukee 1, Wisconsin.

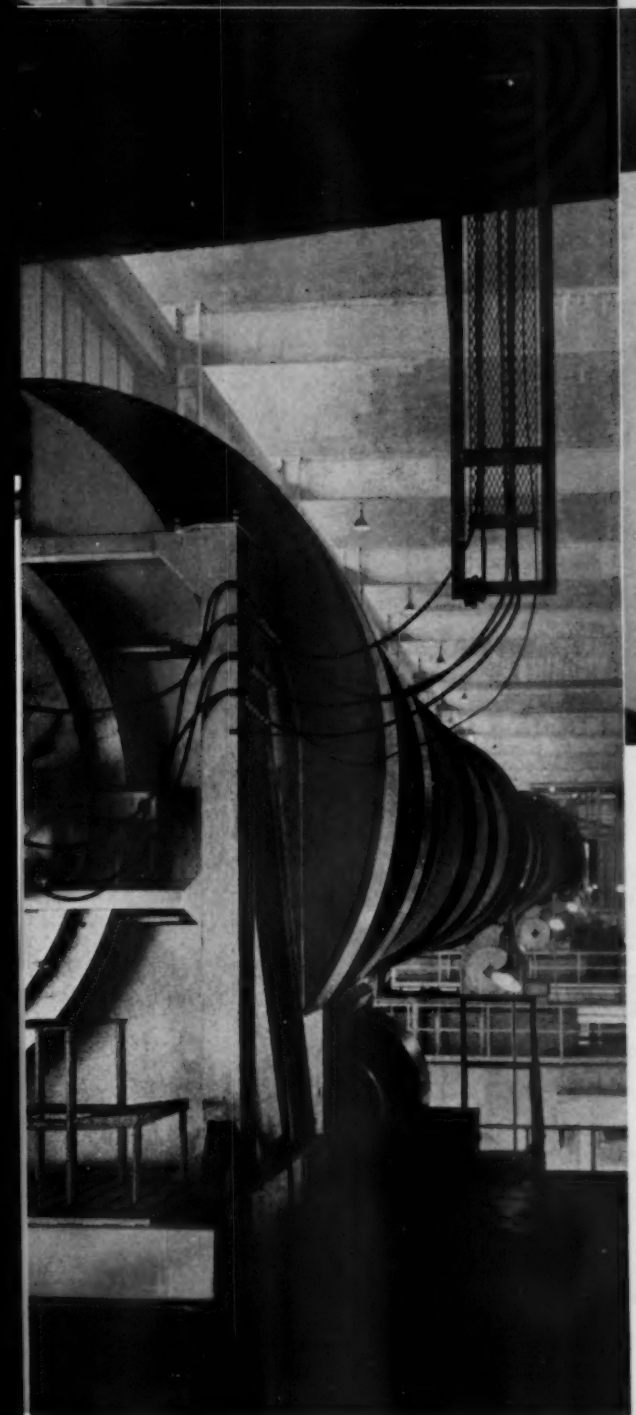
A-1482

Low-Head, Ballpeb and Chlorextol are Allis-Chalmers trademarks.



A-C transformer offers multiple benefits: Located close to the load center in a Midwest cement plant, this 5000-kva CHLOR-EXTOL filled transformer provides reduced power losses, better regulation, and flexibility for expansion. Types available also include oil-filled, liquid-filled, and dry-type units (both sealed and open).

Lowest height, easiest access — 5-kv metal-clad switchgear. Just 72 inches high . . . you get eye-level instrumentation, shoulder-height accessibility. Has front-accessible current transformers — maximum compartmentation and dead-front construction for greater safety. Choice of stored energy or solenoid operated circuit breakers.



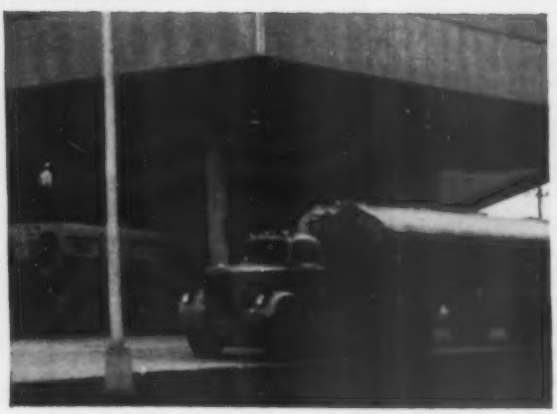
New A-C kilns have many innovations: Latest A-C rotary kilns feature: expansion type ring gears, removable firing hood faces, hydraulic thrust mechanisms, dual drives to overcome critical speed vibrations and independent hydraulically adjustable carrying mechanisms to keep roller faces in proper contact with riding ring face. New ideas in kiln engineering mark each new kiln from A-C.

ALLIS-CHALMERS PRODUCTS: Look to Allis-Chalmers for compressors, controls, crushers, earth-moving equipment, electrical distribution equipment, engines, generators, industrial systems, kilns, lift trucks, mills, motors, pumps, rectifiers, screens; thermal, hydro and atomic electrical generating equipment; tractors, transformers, unit substations.

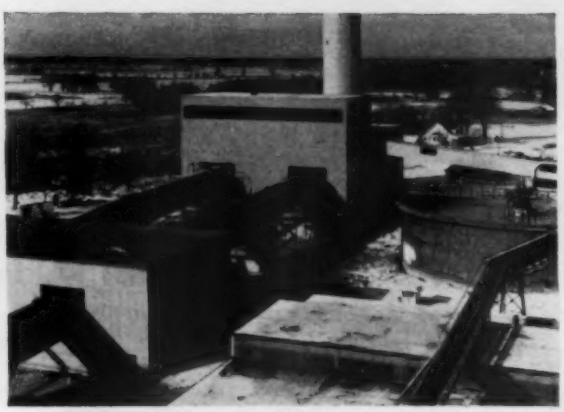
ALLIS-CHALMERS

Enter 48 on card, page 217

DUNDEE CEMENT USES

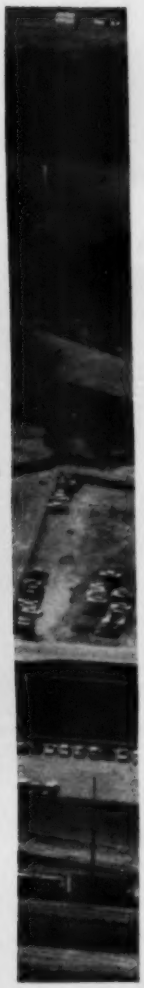


AUTOMATIC LOADING direct from 200,000 bbl. storage silo. Six spouts, fed by reversible belt conveyors, each loads out 300 tons per hour. Three 4-tube bag packers each packs 1,600 bags per hour.



LARGEST IN THE U. S., these F.L. Smidth dumbbell-type kilns are 460′ long and largest diameter is 16′6″. Texaco Meropa Lubricant and Crater 5X Fluid are used for such demanding applications as girth gears and riding rings.

TEXACO PRODUCTS



COMPACT DESIGN of Dundee Cement Co. plant near Dundee, Michigan, cuts total traveling distance of raw material from primary crusher to packing plant to only 4,000 feet.

FOUR CONTROL PANELS run entire operation. This panel controls mills. Others control: clay preparation, limestone preparation, and kilns. All equipment—from primary crushers to weighing scales—is 100% Texaco-lubricated.

New, 6,000,000-barrel Dundee Cement Co. plant —the world's largest built at one time—depends on Texaco for efficiency and maintenance economy

Huge as it is, the $25,000,000 plant is completely operated by just *four* control panels. What's more —the design permits *doubling* plant capacity without altering any present installations.

Keeping this vast complex of highly automated equipment running efficiently calls for a lubrication program that is simple, complete, and virtually foolproof. Dundee chose Texaco to help them with the job.

With Texaco's Organized Lubrication Plan as a framework, Texaco and Dundee engineers worked out the right lubricants for every piece of equipment.

A Texaco Lubrication Engineer will gladly show you how Texaco's Organized Lubrication Plan can fit into your operation...how it can mean greater efficiency and maintenance economies. Call the nearest of the more than 2,300 Texaco Distributing Plants, or write Texaco Inc., 135 East 42nd Street, New York 17, N.Y.

TUNE IN: TEXACO HUNTLEY-BRINKLEY REPORT, MON. THROUGH FRI.—NBC-TV

TEXACO

Throughout the United States
Canada • Latin America • West Africa

Depth of Plowing May Affect Requirement Of Limestone on Soil

"I applied limestone last year before plowing, according to soil test. This year the soil test shows I still need lime. Why?"

Probably you have heard this comment and query many times. One answer may be depth of plowing.

Soil test recommendations are made on the basis of the amount of ground limestone needed to neutralize the soil to a depth of *6 in.* An acre of soil to a 6-in. depth weighs about 2 million pounds. A soil test recommendation of 2 tons of ground limestone per acre means that it will take 2 tons of ground limestone to raise the pH of 2,000,000 lb. of soil to 7.0.

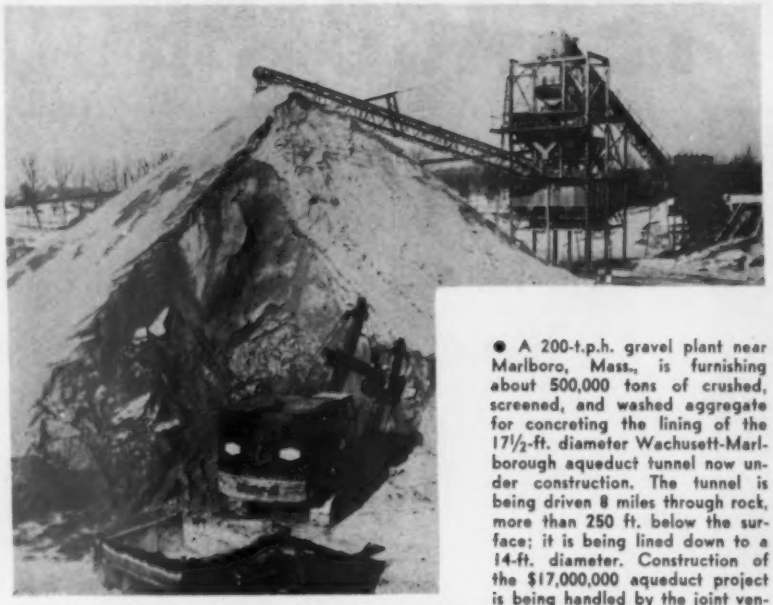
However, let us assume that the farmer plows *9 in. deep.* Now, he has mixed the limestone through 3,000,000 lb. of soil. The result is that the soil acidity was not corrected as expected.

Actually, in this case, as the farmer is liming 50 percent more soil, he should use 50 percent more limestone. He should have used 3 tons of ground limestone per acre.

Limestone applications should be varied with plow depth, according to the following table:

Soil Test Requirement	Plow Depth	Limestone Required
2 tons	4 in.	2,700 lb.
2 tons	5 in.	3,300 lb.
2 tons	6 in.	4,000 lb.
2 tons	7 in.	4,700 lb.
2 tons	8 in.	5,300 lb.
2 tons	9 in.	6,000 lb.

—Missouri Limestone News



● A 200-t.p.h. gravel plant near Marlboro, Mass., is furnishing about 500,000 tons of crushed, screened, and washed aggregate for concreting the lining of the 17½-ft. diameter Wachusett-Marlborough aqueduct tunnel now under construction. The tunnel is being driven 8 miles through rock, more than 250 ft. below the surface; it is being lined down to a 14-ft. diameter. Construction of the $17,000,000 aqueduct project is being handled by the joint venture of Perini Corporation and Walsh, Morrison-Knudson, with Perini as the managing company. The plant was designed, built, and erected by the New England Road Machinery Company.

New Brief Available On $CaCl_2$ in Concrete Work

A new brief on *Calcium Chloride for Concrete Construction* has been issued by the Calcium Chloride Institute. The publication was designed for ready mixed concrete operators, contractors, and engineers who wish to accelerate the set of concrete, especially at temperatures below 70 deg. F.

The brief lists major beneficial effects of using calcium chloride for this purpose, and tells how to prepare and use calcium chloride in standard solution. It contains charts on early compressive strength and calcium chloride with air-entrained concrete.

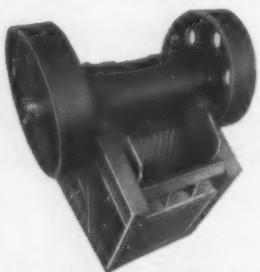
Copies are available on request from the Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C.

Engineers and Manufacturers Since 1885—"BEST BY EVERY TEST"

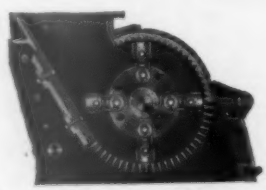
GRUENDLER REDUCTION UNITS

For a lifetime of economical service

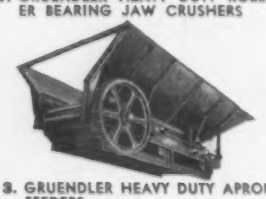
Seldom equalled for low cost, large ratio reduction of uniformly crushed AGGREGATE and AG-STONE. The dependable service of Gruendler Reduction Units have paid off over the years and the testimonials from the Producers of Aggregate and Ag-Stone speak for themselves. Gruendler Equipment plays an important part in our Nation's large Highway and Ag-Stone Program. (Here shown) are a few of our most popular units.



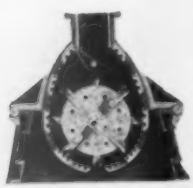
1. GRUENDLER HEAVY DUTY ROLLER BEARING JAW CRUSHERS



2. GRUENDLER CONVENTIONAL IMPACT HAMMER MILLS



3. GRUENDLER HEAVY DUTY APRON FEEDERS



4. GRUENDLER CENTER FEED FINE GRINDER

Write for Bulletins and information (no obligation)

GRUENDLER CRUSHER & PULVERIZER CO.

Dept., PQ-561, 2915 N. Market St., St. Louis 6, Mo., U.S.A.

Enter 52 on card, page 217

GARDNER-DENVER MAKES THE NEWS

ALL NEW ROTA-SCREW

Portable air compressors

GARDNER-DENVER
ROTA-SCREW

Gardner-Denver
engineers a proved principle into a totally new design in portable air compressors

Lowest maintenance ever!
No touching parts . . . *no* valves . . . *no* pistons . . . *no* blades to inspect or replace.

Instant compressed air!
Flip a switch to start; turn knob for immediate warm-up. Flip a switch to stop . . . *automatic blowdown.*

Pulsation-free air flow!
Continuous delivery of compressed air in a *new, efficient manner* . . . vibrationless operation.

Off-level operation!
Oil circulating system permits operation on *angle—uphill or down.*

Saves fuel!
"THRIFTMETER"® control *matches engine speed* with air demand.

All-weather operation!
Tested for *40° below* to *115° above zero.*

THREE MODELS

SP900—capacity: 900 cfm.
SP600—capacity: 600 cfm.
SP125—capacity: 125 cfm.

GARDNER-DENVER Since 1859

GARDNER - DENVER
QUINCY, ILLINOIS

See why the Rota-Screw is the compressor for you

You get new economy...new efficiency... new durability with Gardner-Denver's new Rota-Screw compressors

The Rota-Screw operates without metal-to-metal contact in the compressor chamber. Rotors are separated by timing gears, held to precise clearances between rotors and casing by heavy-duty bearings. Absence of blades, pistons, valves and other reciprocating parts extends compressor life, reduces maintenance to a trifle. Costly, pesky, blade inspection or replacement completely eliminated.

Oil flooding of rotors seals air in, removes heat of compression. Single-stage compression eliminates start-up problems—and there are no complicated interstage air passages.

SPECIAL CATERPILLAR ENGINES—Rota-Screw compressors are driven by turbo-charged, 4-cycle, 1800 rpm engines. Caterpillar-designed especially for Gardner-Denver Models SP900 and SP600 rotary screw compressors.

SHOCK-ABSORBING COUPLING—no clutch—rubber block drive provides smooth power transmission between engine and compressor.

DE-AERATING RADIATOR—removes air from the water to supply a solid stream of water for cooling the compressor oil and the engine.

FAIL-SAFE, 24-VOLT ELECTRICAL SYSTEM—if fault occurs, unit will not start . . . will shut down if running.

EASY COLD-WEATHER STARTING—engine equipped with glow plugs and ether starting aid system.

IMPROVED RUNNING GEAR—extra-heavy running gear with automotive-type steering. Heavy-duty truck tires resist punishment of rough terrain.

DRY-ELEMENT-TYPE AIR FILTERS—shortens servicing time on filters.

ADDITIONAL IMPORTANT FEATURE—units are designed for accessibility . . . featuring *grip handles* and *step plates* for top service.

THREE MODELS

Model SP900 . . . 900 cfm

Model SP600 . . . 600 cfm

Model SP125 . . . 125 cfm
(Turn wheel optional.)

How Rota-Screw compresses air

A time-proved principle forms the basis for Gardner-Denver Rota-Screw compressors. As air enters the intake port, it is drawn into the space between lobes of two helical rotors. The revolving rotors force the air into succeedingly smaller interlobal spaces, thus compressing the air in a single stage until full compression is reached at the outlet port. As this air is expelled, the next groove comes into line with the outlet port to assure a smooth air flow without pulsation —cycle after cycle. Compressor operates without vibration . . . air tool performance improves.

Water-oil cooling system

Gardner-Denver's effective water-oil cooling system provides constant operating temperature for both engine and compressor under all climatic conditions from –40° to +115°. Discharge air temperature is normally kept between 170° F. and 190° F. with average operating conditions at 100 psi. Combined oil receiver and separator preserves oil supply, cleans air of oil.

SPECIFICATIONS

Model	SP900	SP600	SP125
Capacity at 100 psi	900 cfm	600 cfm	125 cfm
Engine	Caterpillar D343T	Caterpillar D333T	Continental F-266
Length	13′7″	12′1½″	12′1″
Width	6′8″	6′	5′4½″
Height	8′½″	7′	5′5″
Track	5′8″	5′	4′8″
Turning radius	12′	8′	—
Net weight	13,775 lb.	9,150 lb.	2,980 lb.

For complete specifications, write for Bulletin SP-1.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Ill.—Offices in principal U.S., Canadian and Mexican cities.
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario.

International: Gardner-Denver International Division, 233 Broadway, New York 7, N.Y.
Offices: Buenos Aires, Argentina; Artarmon, N.S.W. Australia; Brussels, Belgium; Rio de Janeiro, Brazil; Santiago, Chile; Barranquilla, Colombia; Lima, Peru; Ndola, N. Rhodesia; Salisbury, S. Rhodesia; Johannesburg, Transvaal

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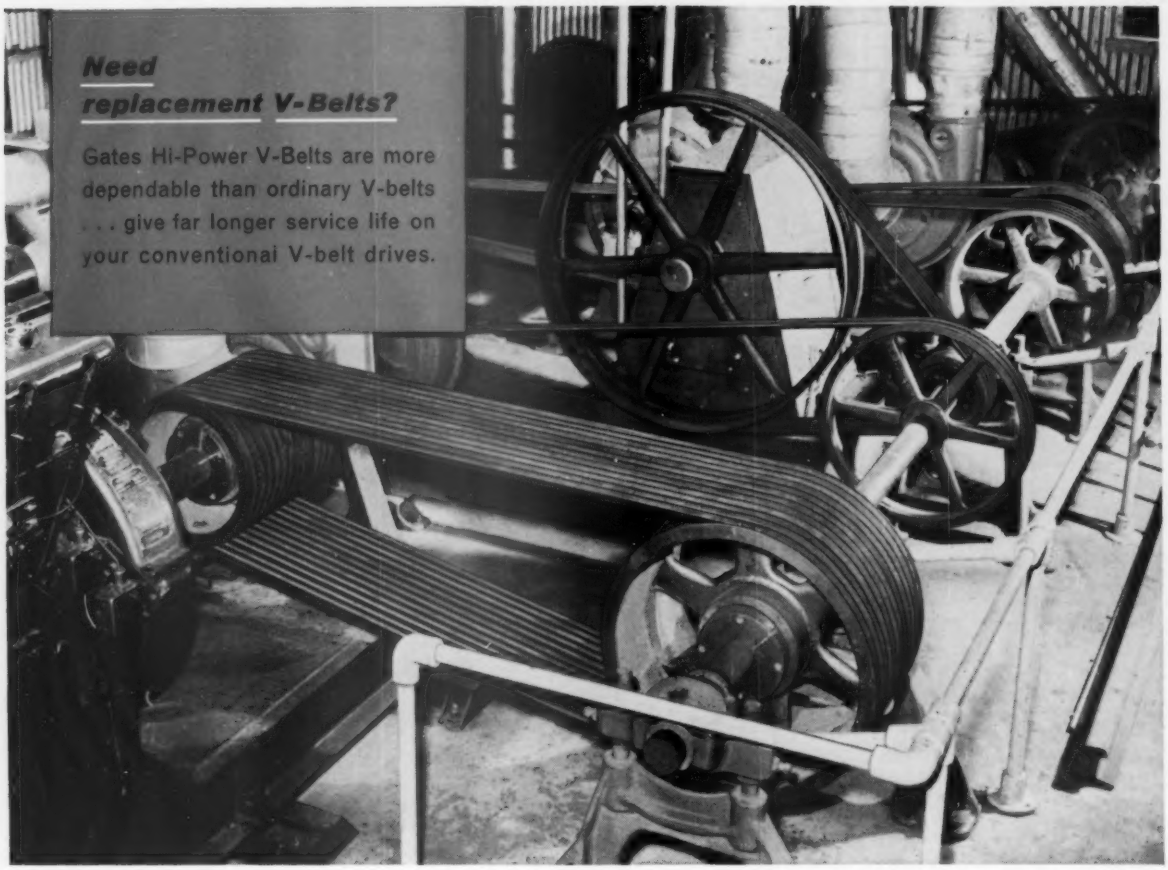

Need
replacement V-Belts?
Gates Hi-Power V-Belts are more dependable than ordinary V-belts . . . give far longer service life on your conventionai V-belt drives.

Why Gates Hi-Power V-Belts are industry's No. 1 choice for replacement belts

There are several important reasons why Gates Hi-Power V-Belts are preferred by most industrial V-belt users today.

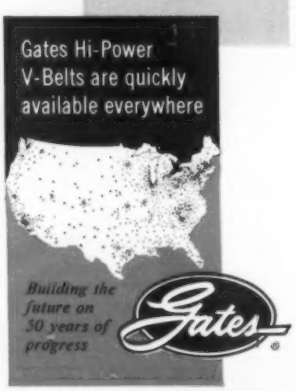
The exclusive construction features of Gates Hi-Power V-Belts—Concave Sides (U.S. Pat. No. 1813698), Precisely-Engineered Arched Top, Flex-Bonded Tensile Member—make them more dependable than ordinary, conventional V-belts, giving you far longer belt life on even the toughest applications.

Moreover, because of Gates high standards of quality control, you get a perfectly matched set of Hi-Power V-Belts every time—every belt pulls its share of the load throughout the long service of the drive, further increasing belt life.

You get fast delivery from local stocks.

Gates Distributors, located in all parts of the country, have large stocks of Hi-Power V-Belts on hand, backed by Gates Service Centers in every major industrial area. This means that you can get replacement V-belts quickly, day or night—reducing to a minimum costly production down-time.

The Gates Distributor near you is a dependable source of supply for most of your maintenance needs. Call him for fast delivery of Gates Hi-Power V-Belts.



The Gates Rubber Company, Denver, Colorado BP 40

Gates Hi-Power V-Belts

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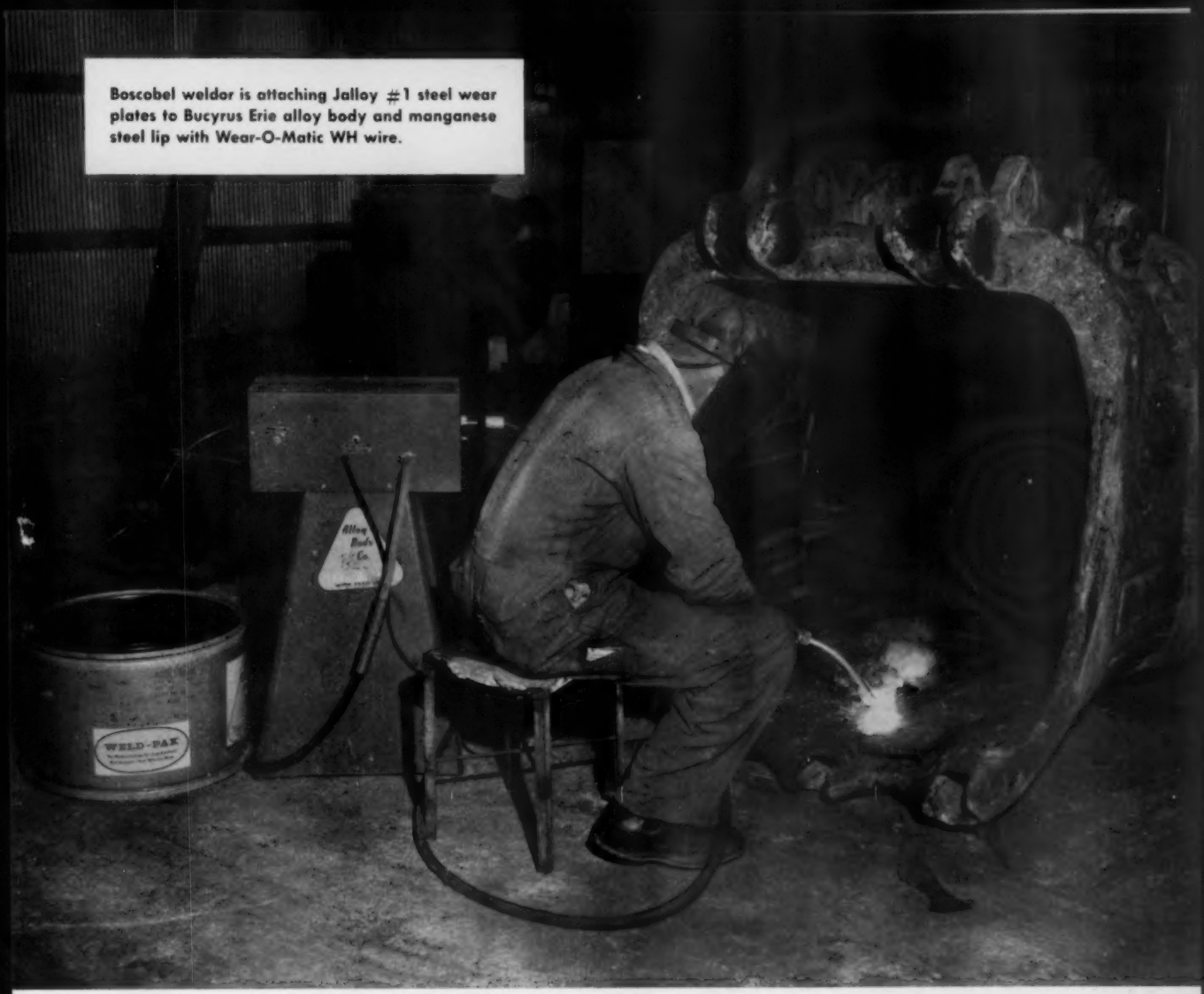


Boscobel weldor is attaching Jalloy #1 steel wear plates to Bucyrus Erie alloy body and manganese steel lip with Wear-O-Matic WH wire.

35% *Savings on bucket maintenance with NEW Wear-O-Matic WH welding wires*

"Wear-O-Matic WH is the most versatile welding wire for bucket maintenance because it provides high strength welds in any of the popular alloy steels and has excellent resistance to impact when used for build-up work. Savings in time and labor through the semi-automatic open arc application of this wire have resulted in less bucket down time and lower costs."

L. ARDEN HENLEY, SUPT.
BOSCOBEL GRANITE CORP., MANAKIN, VA.

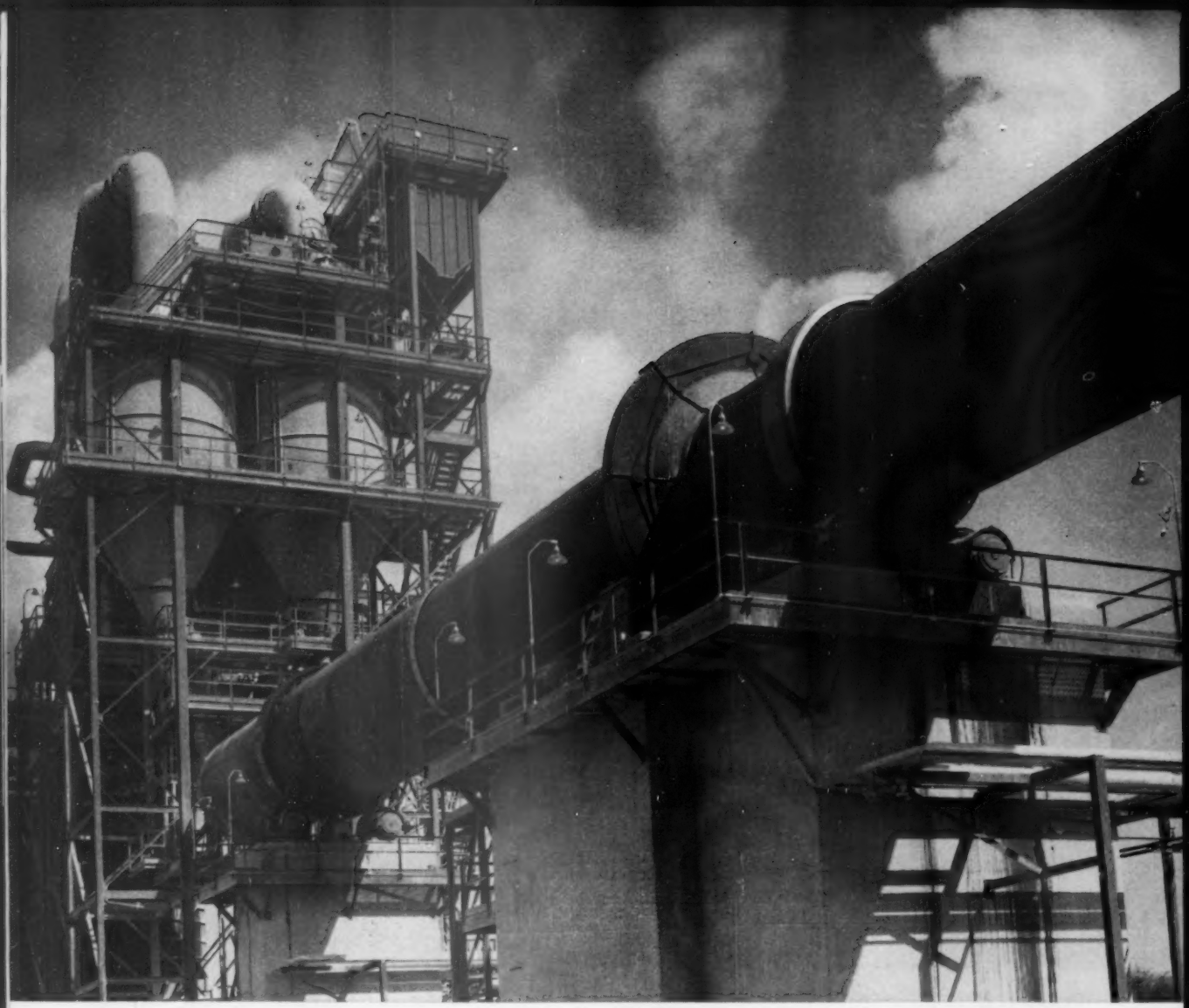
What about bucket maintenance in your shops? Costs too high due to too many manual welding applications? The important benefit gained by Boscobel Granite was the elimination of manual welding with stainless steel electrodes to obtain the necessary high strength attachment welds for their rugged rock handling chores. These benefits can be yours whether you are welding manganese to manganese, manganese to carbon steel or either of these to any of the abrasion or impact resistance alloy steels. Then, without changing wires, your weldor can apply build-up deposits to lesser worn areas such as latch pins, keepers and lips . . . a deposit that will work harden to outwear manganese steel. To put more service life in the business end of your shovels and drag lines, investigate today the semi-automatic open arc application of Wear-O-Matic WH wires. You'll lower your maintenance costs . . . decrease down time and increase working life. For complete details, request Bulletin AR-21. Alloy Rods Company, P. O. Box 1828, York 32, Pa.

ALLOY RODS COMPANY

YORK, PENNSYLVANIA

SALES OFFICES & WAREHOUSES; BOSTON, NEWARK, PHILADELPHIA, PITTSBURGH, BIRMINGHAM, CHICAGO, SAN FRANCISCO & EL SEGUNDO, CALIF.—DISTRIBUTORS IN ALL OTHER PRINCIPAL CITIES

TWENTY YEARS OF LEADERSHIP IN THE DEVELOPMENT OF QUALITY ALLOY ARC WELDING ELECTRODES



Foxboro Electronic Control Specified for New Hawaiian Cement Plant

Compact Foxboro Electronic Consotrol* Control Panel for new Hawaiian Cement Plant. Fully coordinated instrument system includes transmitters, controllers, recorders, converters, integrators, alarms — all solid-state — all linked by a common 10-50 ma. d-c signal. Transmission is over simple, unshielded lines. *Reg. U.S. Pat. Off.

Company cites excellent instrument performance and engineering service at Riverside Cement as reasons

"We practically 'carbon-copied' the control system at our Riverside Cement plant in California and installed it in Hawaii," reports Mr. Howard R. Starke, Executive Vice President, Hawaiian Cement Corp. Mr. Starke serves in managerial capacity for both organizations.

"Our excellent operating experience at Riverside with Foxboro instruments and Foxboro engineering service made this decision practically automatic."

Located on Barber's Point, Oahu, the new Hawaiian Cement Plant has all process variables — including pressures, temperatures, motion, differential pressures, motor speeds, gas-analysis, and gas-air ratios — under Foxboro control.

What about your expansion or modernization plans? Why not investigate how Foxboro Electronic Instrumentation can help you produce better cement — at lower cost. Ask your nearby Foxboro Field Engineer for details.

Or write for Bulletin 21-10. The Foxboro Company, 225 Norfolk St., Foxboro, Massachusetts.

FOXBORO

REG. U. S. PAT. OFF.

Profit Producers prefer

HYDRASTROKE*
HEAVY-DUTY FEEDERS

Reciprocating Feeders to feed Screens, Crushers, Belts, Trucks, Skips or Railroad Cars.

- **EXCLUSIVE HYDRAULIC OPERATION**
  Designed for low installation, operation and maintenance costs.
- **DESIGNED FOR SEVERE SHOCK LOADING**
  Special rugged construction assures durability.
- **ROCKER MOUNTING OR SUSPENSION**
  Eliminates wear due to friction, needs no lubrication, takes minimum head room.
- **WIDE RANGE OF SIZES**
  Widths 36" to 96" . . . feeding capacities from 200 to 7500 tons per hour.

PATENT APPLIED FOR

NICO Write for Illustrated Brochures *TRADEMARK REGISTERED

NATIONAL IRON COMPANY

50th Avenue West and Ramsey Street • Duluth 7, Minnesota

Subsidiary of Pettibone Mulliken Corporation, Chicago 51, Illinois

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Ranomatic A, BX, C and D

ARE TUBULAR TYPE COILED WIRES FOR

HARD SURFACING

BY THE AUTOMATIC OR SEMI-AUTOMATIC PROCESSES

COMPOSITIONS OF DEPOSITS MADE BY THEM ARE COMPARABLE TO THOSE MADE FROM THE TIME-TESTED

RANITES A, BX, C AND D STICK ROD

SOLD THROUGH YOUR LOCAL DISTRIBUTOR

RANKIN MANUFACTURING COMPANY

616 SOUTH MARENGO AVENUE • P. O. BOX 631 • ALHAMBRA, CALIFORNIA

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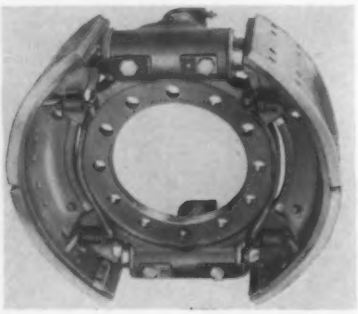
new machinery



● The heavy-duty Stopmaster brake introduced by Rockwell-Standard Corporation for off-highway operations reportedly offers a new concept in brake design.

Hydraulically actuated, the brake provides equal braking effort by both shoes. The unit is said to be equally applicable to straight-hydraulic, air-over-hydraulic, or vacuum-over-hydraulic actuation. In air-over-hydraulic systems air volume requirement is reduced considerably, and power units can be more ideally located, and better protected.

According to the manufacturer the results give improved performance, cooler operation, and uniform lining wear.

Periodic lubrication is eliminated, as all actuation parts are located internally, with sealed in lubrication. The unit is available in 17-, 20¼-, 22-, and 26-in diameters, and 4- to 10-in. widths. Automatic adjustment is an optional feature. **(350)**

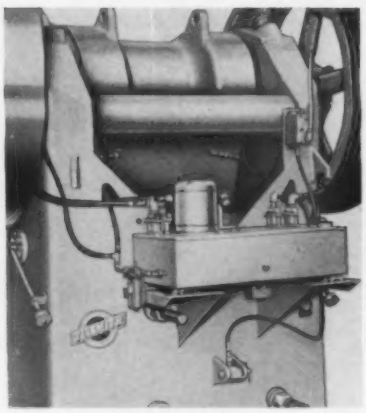
● The latest addition to the torque-arm speed reducers manufactured by Dodge Manufacturing Corporation is the Size 17 single reduction unit.

It has a 5:1 gear ratio reportedly capable of transmitting 50 percent more horsepower at output speeds up to 400 r.p.m.

The shaft-mounted reducer develops greater torque than any other single reduction unit in the line, and can accommodate 60-hp. motors in the top range of output

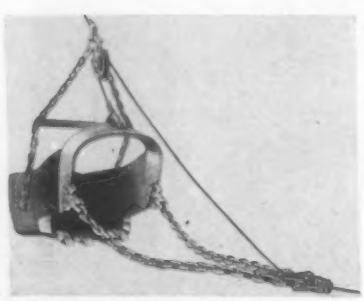
speeds based on Class 1 A.G.M.A. ratings. This unit can be applied to equipment operating in the speed range above that of Dodge 15:1 and 25:1 double reduction reducers, and in the horsepower range exceeding that of the No. 16 reducer.

The No. 17 is available from stock for horizontal shafts, but can be obtained on special order for vertical or inclined shafts. **(351)**



● A patented oiling system for Telsmith jaw crushers has been developed by the Smith Engineering Works. The system is said to eliminate the risk of crusher bearings running dry if ungreased, or overheating if overgreased.

The compact, self-contained oiling unit is mounted on the crusher and operated by its own tank-mounted pump and motor. Freshly filtered oil is pumped through the filter into the crusher bearings and returned to the reservoir tank through flexible hoses. As a result, oil changes are required only once in 1,000 hr., or four months of full capacity operation. **(353)**

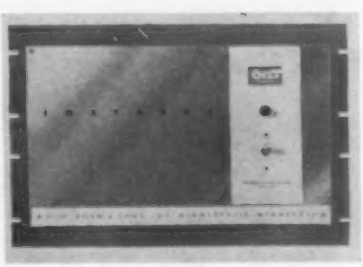


● Buckets for draglines in the 4- to 7-cu. yd. range are offered by Page Engineering Company.

The line of specialized buckets, constructed to meet exact digging requirements, are offered in two groups. The general purpose units are designed for contracting operations where a variety of materials are encountered.

The heavy duty units are constructed for digging in rugged material such as hardpan, blasted rock, shale, etc.

Illustrated in a clevis hitch is the Page 4- to 7-cu. yd. automatic dragline bucket. **(352)**



● Using an Onan Instapac prevents the shutdown of fuel-burning equipment protected by Fireye flame safeguard controls when commercial electrical power is interrupted.

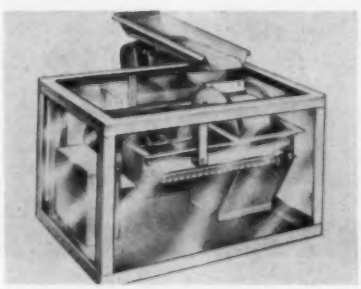
The sequence of operation is: 1. Commercial power is connected

and equipment

for further information use card on page 217

through the transfer relay of the Instapac to the control system. This relay coil is not energized. 2. When a power outage occurs, the sensing relay in the Instapac, which has been energized by this voltage, releases and starts the inverter, which energizes the coil of the transfer relay, and connects the load to the inverter. The interruption of power to the control system is 0.017 seconds, or a little more than one cycle of 60-cycle power. 3. The Instapac supplies power to this load as long as it is required, limited only by the size of the batteries. 4. When commercial power returns, or a standby generator is started, the Instapac shuts itself off, the transfer relay de-energizes and connects the load back to the power line. The interruption of power to the control system is about 0.011 seconds or ¾ of a cycle of 60-cycle power.

All safety problems have reportedly been solved. Details are available from manufacturer. (354)



● A gravimetric feeder with a weigh wheel has been designed by Syntron Company for the accurate, continuous weigh feeding of bulk materials.

The unit is said to increase the capacity and efficiency of grinding mills, dryers, and mixers.

The "Vibra-Flow" vibratory feeder feeds the material onto the scale-beam-mounted constant-speed weigh wheel when the poise has been set on the beam for the required rate. The over and under movements of the beam actuate the "weigh-stat" control. This automatically decreases or increases the feed rate of the feeder, compensating for more or less material on the weigh wheel.

Five models, from 500 lb. to 300 t.p.h., are available. (355)

● A portable screw type air compressor, believed to be the first of its kind, is being offered by Gardner Denver Company.

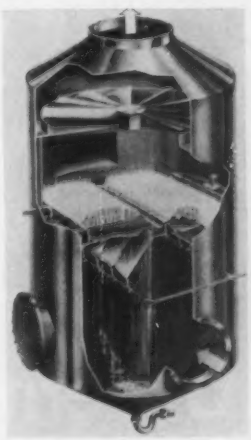
Three models of the new line, the Rota-Screw, are initially available. The 900 c.f.m. and 600 c.f.m. units are powered by newly designed 6-cylinder Caterpillar diesel engines, and the 125 c.f.m. size is powered by a 6-cylinder Continental gasoline engine. Operating pressure of all models is 100 p.s.i. at 1,800 r.p.m.

The unit operates as follows: air entering the intake port is drawn into the space between the lobes of two helical rotors. The revolving rotors force the air into succeedingly smaller inter-lobal spaces, compressing the air in a single stage until full compression is reached. As air is expelled, the next groove comes into line with the outlet port to assure smooth free flowing air without pulsation.

A number of features are offered. The compressor is designed to operate at extremes of temperature from -40 to 115 deg. F. Glow plugs heat the air and fuel for certain starting in low temperatures. As there is no metal contact in the compression chamber there is no wearing of parts. A fail-safe electrical system stops the compressor should any malfunction occur. The oil recirculating system permits operation on angle—uphill or down. Off-on switches give instant compressed air. (356)

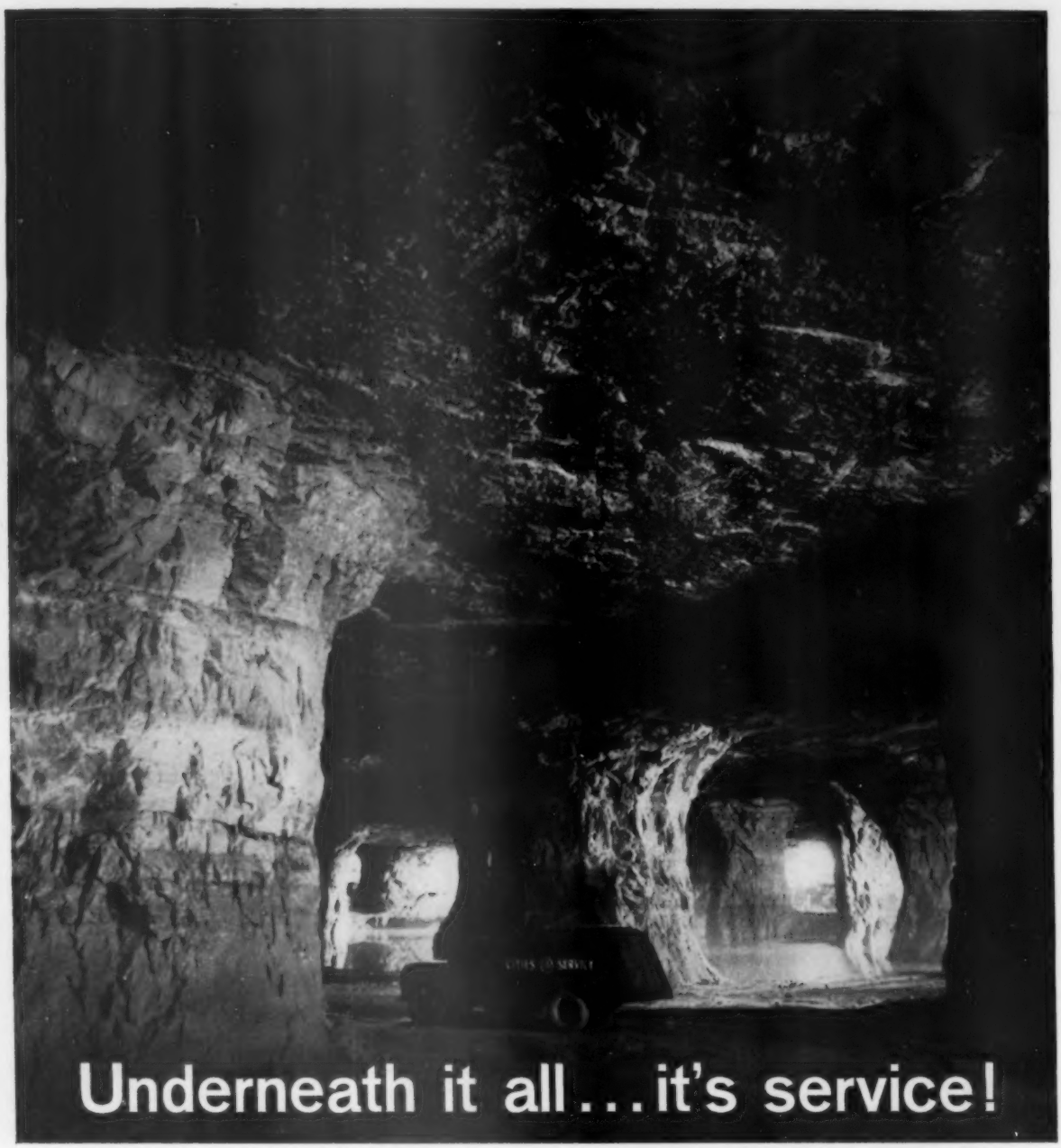
● A new line of impingement-plate-type scrubbers for wet cleaning, absorption, or cooling of gases has been announced at The W. W. Sly Manufacturing Company.

The Impinjet scrubber can be used for wet dust collection from such applications as kilns, driers, and furnaces. In gas cooling applications the scrubber reportedly can handle extremely high temperatures, reducing gas temperatures to the required level with maximum utilization of the cooling liquid. The single-stage scrubber handles dust loadings



of up to 100 grains per cu. ft. at the inlet. Suspended materials in a gas stream that range from submicron fumes to dust particles in the larger micron sizes can be removed with an efficiency in excess of 99 percent on many types of dust.

According to the manufacturer pressure drop and resulting power requirements are low. A single-stage unit can have a pressure drop as low as 2½ in. and maintain high efficiency. If extra-high efficiency is desirable additional plates can be added without increasing liquid consumption. (357)



Underneath it all... it's service!

THERE's only one way to get to the Weiler Marble Company quarry of Ste. Genevieve, Missouri. Down a rough dirt road . . . over a steep hill . . . and deep into the ground. This is no problem to Cities Service. It's just another example of how every customer gets reliable service . . . no matter where he is!

The Weiler Company has depended upon Cities Service for the past 2½ years. Mr. Herman Weiler, President, is impressed with the products as well as the service. For drilling, his company counts on Neptune 13Z oil. He states, "It's the best drill oil I've ever used. Really sticks to the metal it's applied to."

Mr. Weiler's Schramm 600 air compressor engine has been running 12,000 hours on DC-300 oil without a repair. Results such as this convinced him to use nothing but Cities Service products for all his equipment.

Mr. Weiler gets expert technical help, fast dependable service, and the best products available . . . all from Cities Service. You will, too! For more information, contact your nearest Cities Service Office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

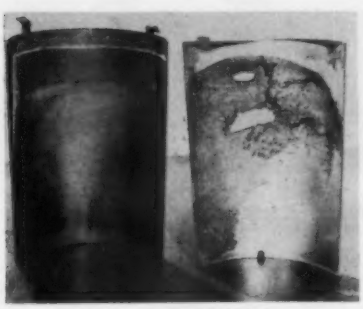
CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

● Two new blasting machines are now offered by Vibration Measurement Engineers, Inc. These machines incorporate several features in high capacity condenser discharge blasting machines. In size, the "VME-Sr." has been reduced from 50 percent to 70 percent below that of blasting machines previously available. The weight has been reduced by approximately 50 percent.

The VME-Sr. is a 450-v. rated blasting machine which weighs 15 lb. and has a recommended capacity of 50 caps in straight series for primary blasts and 200 caps in straight series for secondary blasts. 50 caps can be shot in straight parallel and 1200 in series parallel arrangements.

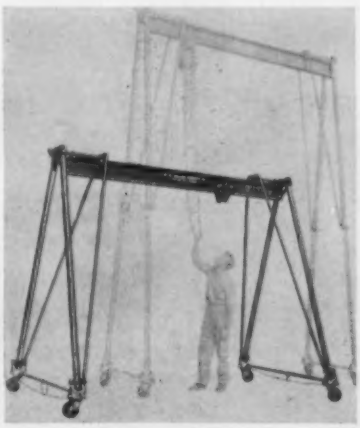
The "VME-Jr." is rated at 225 v. and weighs 8 lb. Its recommended capacity is 30 caps in straight series for primary blasts and 100 caps in straight series for secondary blasts. In series parallel 240 caps can be shot. The VME-Jr. is not recommended for straight parallel shooting. A unique feature of the VME blasting machines is the maintenance contract with each unit. **(358)**



● A fabric-backed urethane, Armstrong PO-663, provides maximum abrasion resistance for equipment handling rock, sand and gravel, ore slurries, glass, and other similar abrasive materials.

The material, according to the manufacturer, Industrial Division of Armstrong Cork Company, reduces costs by protecting expensive chutes and equipment, has longer life, and allows use of thinner gauge materials. It is easily installed by cementing or by bolting. The standard stock sheet sizes range from 12 x 20 in. to 96 x 40 in., in 1/16-, ⅛-, and ¼-in. gauges. Special sizes and gauges are available on request.

The illustration shows two sections of loading chutes which were used the same length of time, the one on the left, lined; the one on the right, unlined. **(359)**



● Adaptability is the feature of the Magic-Pole Universal Gantry manufactured by B. E. Wallace Products Corp.

The legs telescope for height adjustment, and the tread width is adjustable. Actual adjustment of the leg span along the I-beam gives the exact span required. The gantry has up to 6 ft. of height adjustment, and can be set on two different levels, including truck beds, platforms, and pits.

The unit is available with steel or aluminum alloy I-beams in spans to 30 ft., heights to 17 ft., and capacity to 4 tons. In addition, it is light and easily stored.

A self-leveling I-beam hangs plumb from the ends of the A-frames, allowing the trolley to travel the full length. The legs may be attached at any point along the I-beam to enable the user to adjust the gantry's length. **(360)**

POKER? Play to win!

How would you play this hand?

Not strong, but play it. Two times in three you'll be high hand before the draw. Raise to drive out pairs. Then stand pat. It's 12 to 1 you couldn't fill anyhow, and it helps set up later, better hands.

Here's a sure winner from FORD:

New Ford 4000 Heavy Duty Fork Lift! Strength, stability and big-tire traction for fast, safe materials handling on rough terrain.

4000 lbs. rated load at 24" load center. Conforms to or exceeds all Fork Lift Industry stability and capacity recommendations.

Five basic models with 10' to 21' lift heights. Two and three-stage telescoping masts with unusually low collapsed heights. Especially built for rough terrain. Its mobility and low collapsed mast height adapt it for work in many areas with low doorways and narrow aisles.

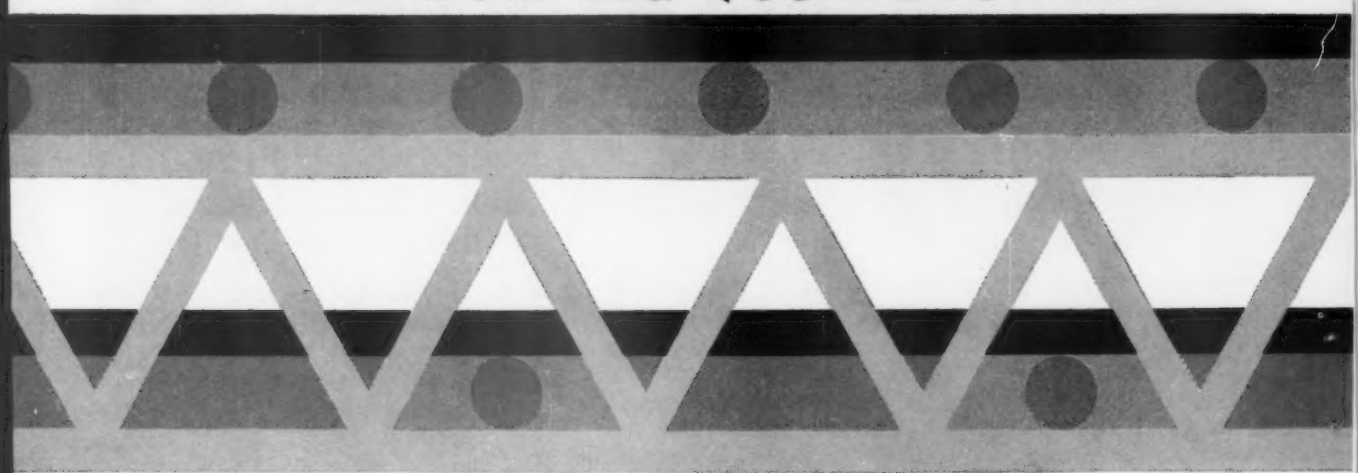
Get details from your Ford Tractor Dealer, or write:

Tractor and Implement Division
Ford Motor Company
Birmingham, Michigan

Ford
TRACTORS
EQUIPMENT

Enter 63 on card, page 217

KEEP JOBS MOVING WITH THERMOID BIG T CONVEYOR BELTS



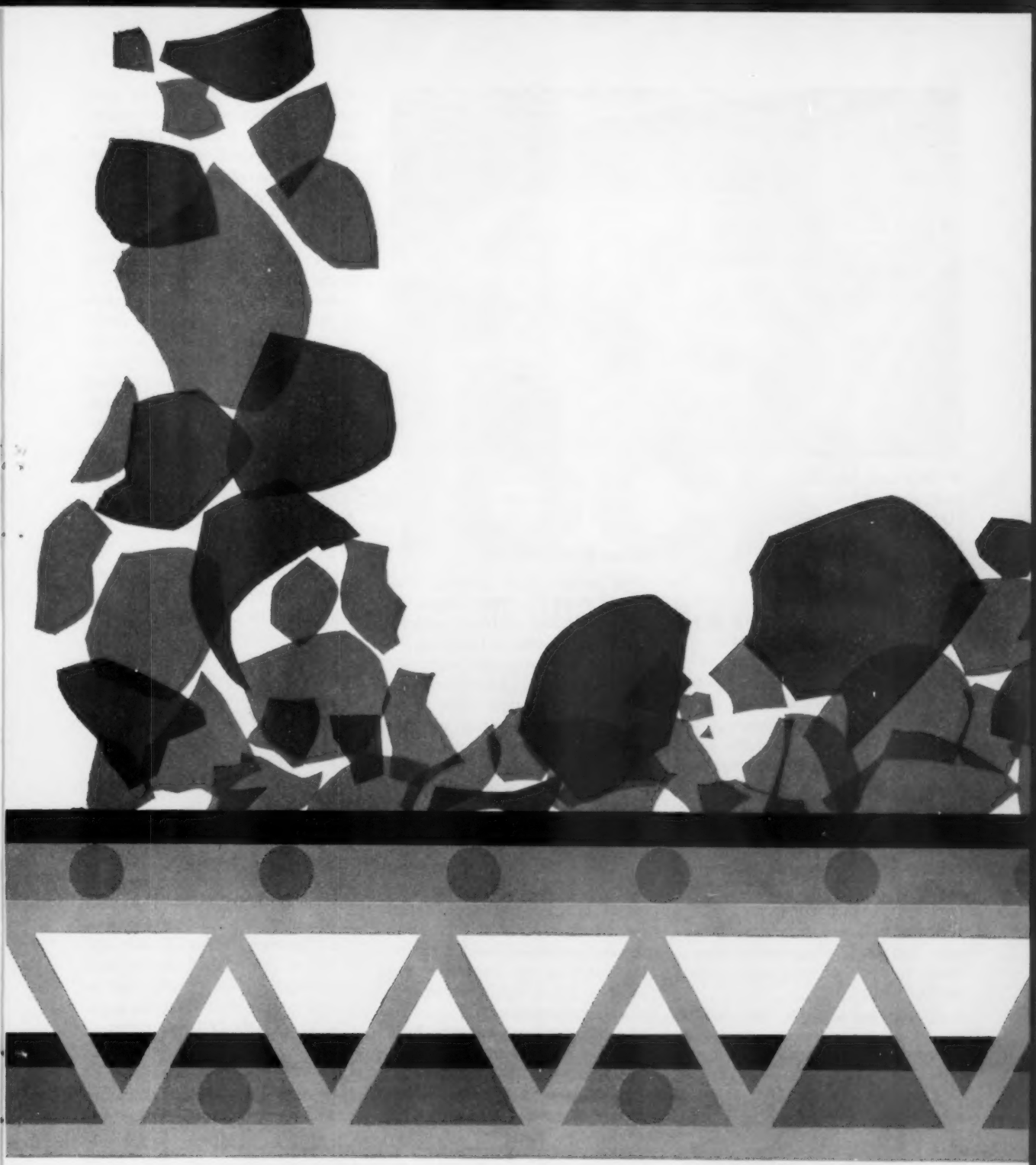
HIGH ABRASION-HIGH IMPACT THERMOID VICTOR BELTING OUTLASTS THEM ALL!

Dolomite, trap rock, flint and other heavy, abrasive materials fail to knock Thermoid VICTOR Belting out of service until long after less rugged belting would have to be scrapped. Thermoid VICTOR Belting stays on the job . . . gets it done with less down-time. A tough, natural rubber cover over nylon breaker strip keeps the belting coming back for more.

Write for complete details today. Then ask your Thermoid Big T distributor to prove how you can cut your haulage costs with Thermoid VICTOR Belting. He also stocks other Thermoid belting of all grades to fit every job requirement.

Quaker Thermoid

Enter 64 on card, page 217



THERMOID DIVISION PORTER H. K. PORTER COMPANY, INC.

200 WHITEHEAD ROAD, TRENTON 6, NEW JERSEY

● Overhead traveling cranes have undergone radical design changes at Harnischfeger Corporation. The innovations include improved electronic components and a pressurized "walk-in" passageway.

The new system reduces original costs and requires about 75 percent less maintenance, yet has a production capacity, over an extended period of time of 200 percent over older systems.

The first two units, complete with pressurized chambers, and the improved electronic controls, were recently installed at a large cement plant in Kansas.

The most obvious change in the new walk-in crane from the usual is that the interior of the main girder is utilized as a well-lighted corridor in which are located strategic controls and power components, and inside which maintenance crews can conveniently work. (See smaller picture.)

Interior aisles of the two cranes of the Kansas installation are 8 ft. high, 5 ft. wide, and extend almost length of the 120-ft. girders.

Hollow-Beam Feature

The hollow-beam feature provides in itself a certain degree of protection for the electronic controls and other components. However, for additional and complete protection from the outside atmospheres in which the crane must often work, each aisle or passageway is pressurized, as the cabin of an airliner. A relatively small but powerful blower forces air continually into the girder screening it through wool-bag filters which automatically clean themselves. A pressure of about 2 lb. above outside atmospheric pressure is maintained. This is ample to prevent dust seepage and protect from excessive heat accumulation from components within the girder. This simplifies the expensive and dangerous job of high-girder inspection and maintenance.

A small, but heavy-capacity, P&H electric hoist is suspended from an I-beam "track" which runs the full length of the ceiling inside the girder. The traveling hoist is used for the easy handling of heavy equipment inside the girder, or to elevate tools through a dustproof hatch from main floor 80 ft. below.

It was previously necessary for wheels at each end of the girder to be propelled from a large centralized electric motor, the power to each wheel being provided through long cross-shafts with their multiplicity of couplings and bearings. With the walk-in design, however, four individual motors can be spotted at the four corners and geared directly to the wheels. (The cross-shaft arrangement is still, according to the manufacturer, considered completely practical for shorter-span cranes. With longer girders, maintenance and repair problems increase almost in direct proportion to the length of the span.)

An adjustable voltage d.c. electronic stepless control is reportedly the first field application of a newly developed bucket control system. By using variations of the control (everything except the bucket hoists being a.c. powered) all eight motions of the crane and its clamshell bucket are governed by two "joy stick" levers instead of four.

Stepless Control System

The most important feature, according to the manufacturer, of the "stepless control" system for the crane itself is the ability to regulate speed and power to an almost infinite degree. From a production standpoint the P&H a.c. electronic stepless control has proved to be faster in operation and more exact in load positioning.

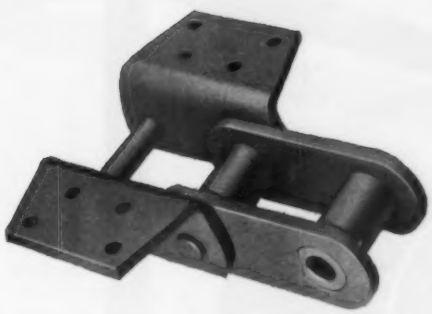
Safety factors are built into the electronic control system, making the overhead traveling crane, according to Frank M. Blum, head of the firm's industrial division, the safest in the history of the industry. The operator's cab, attached beneath the main girder at one end is provided with an almost unlimited "bubble" degree of visibility. It has a combination cool-or-heat air conditioner of its own, and is pressurized against dust seepage. (Shown at right of larger picture.)

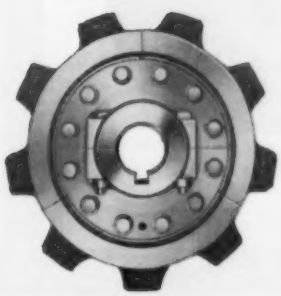
Tough Duty-Cycle

In most installations cranes are seldom required to make more than one or two full-capacity lifts a day. But, these first two P&H walk-in cranes, with rated capacities of 15 tons each, are required at the Kansas installation to make 15-ton lifts on an average of every 53 seconds, through two shifts, for 16 hr. per day. The total amount of material handled is reported to be 540 tons per hour per crane, said to be the toughest crane duty-cycle in the United States. (361)

Built to take repeated SHOCK

in bucket elevator service





You protect your production against many a potential breakdown when you take advantage of rugged Rex components in both your elevators and feeders.

Rex Chains, Sprockets and Buckets have designed-in shock-resistance—they are the result of years of experience in solving the industry's toughest bulk materials handling problems.

REX NO. X-859 ELEVATOR CHAIN: provides the built-in stamina to resist heavy, repetitive shock loadings in the most punishing elevator service. This is the huskiest chain ever designed for bucket elevator service—has unique, Armor Case alloy steel pin that combines maximum shock-resistance with a hard bearing surface for longest wear life. Large bearing areas. And accurate size control assure longest possible service life.

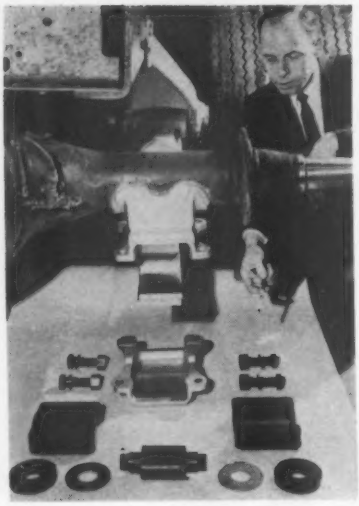
REX SPLIT-HUB SEGMENTAL SPROCKETS: cast of highest quality, close-grained steel—accurately machined—extra-deep hardened sprocket wearing surfaces for shock-resistance and long service life. Rex design allows easy, economical replacement of tooth-rim segments to reduce elevator "down time."

RUGGED REX STYLE AA-RB BUCKETS: cast of tough malleable iron or Rex Z-Metal, which is 25% stronger than malleable, more abrasion- and corrosion-resistant. Back and lip reinforced for extra strength to resist shock and for extra wear life.

For complete information call your Rex Distributor or write CHAIN Belt Company, 4604 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: Rex Chainbelt (Canada) Ltd., Toronto and Montreal.

REX®

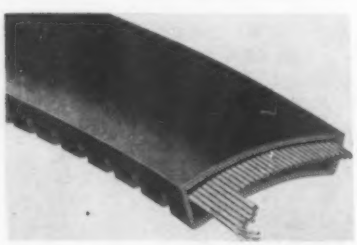
CHAIN BELT COMPANY



● A suspension for tandem axles that requires no lubrication and has its spring ends encased in rubber has been announced by the Axle Division of Eaton Manufacturing Company.

Shown in the foreground of the picture, beneath the rear of the two live axles in the Eaton tandem, are the rubber parts used in one of the four spring ends. Projecting from the axle is the right rear of the suspension.

The total weight of the suspension for a 34,000-lb. axle, including torque arms and brackets, is 761 lb. Other features are 50-in. springs to increase stability, improved handling and good tracking recovery, easy accessibility for maintenance, and interchangeability of all parts. The same design is available for off-highway and on-highway vehicles, covering 28,000- through 38,000-lb. tandem axle applications. **(362)**



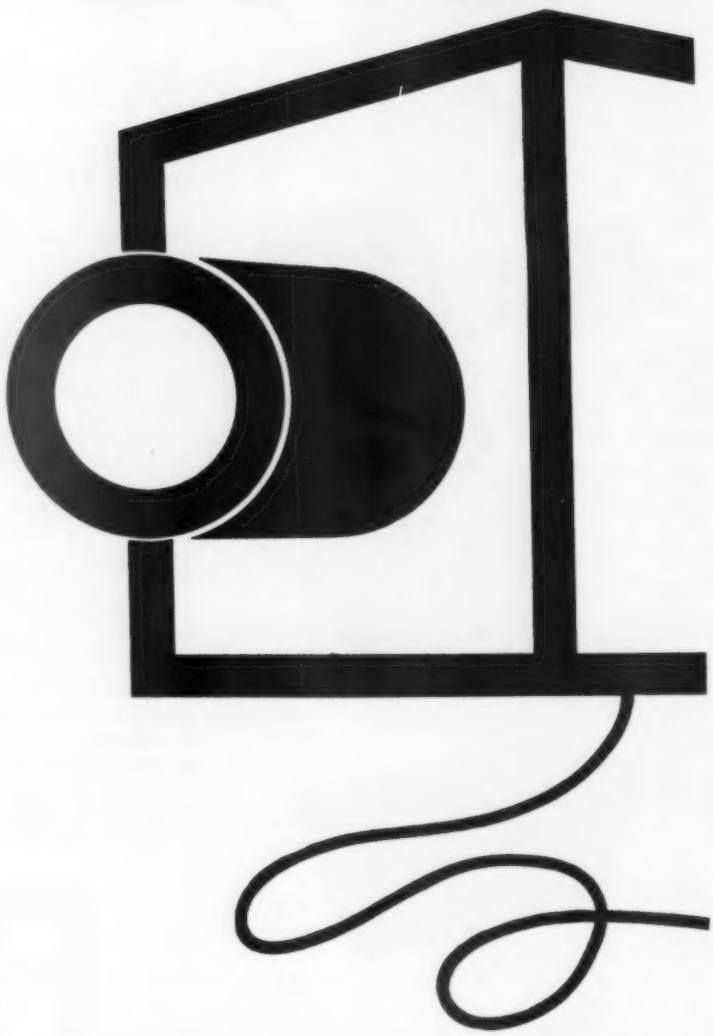
● A new line of variable speed belts in a wide range of sizes and types for all industrial applications has been announced by Lovejoy Flexible Coupling Company. Top widths of standard sizes range from 7/8 in. to 3 in., and nominal over-all lengths from 26.4 in. to 170 in. They feature design and construction to withstand the intense squeezing action of pulley sheave walls and to provide smooth transmission at full power capacity.

The belts are fabricated from fiber-reinforced synthetic rubber which is said to be impervious to oil and heat and remains "live" under static conditions. The manufacturer reports that length stability, whether in use under severe operating conditions or in storage for long periods, is assured by the high stretch-resistant properties of the reinforcing cords.

Uniform notching on the underside provides ample flexibility without excessive strain or distortion on small pulley applications. **(363)**

● Oilrid, manufactured by Oilrid, Inc., reportedly removes oil stains from such surfaces as concrete and stone.

DIAMOND
UTILISCOPE
FIRST IN INDUSTRIAL TELEVISION



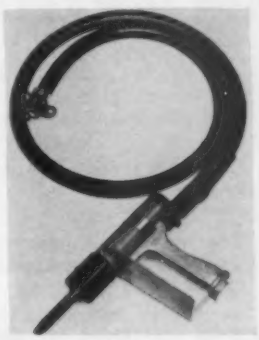
The formulation is said to open the pores of the material being cleaned and absorb the oil that has seeped in. It is applied to the stained area a quarter of an inch thick and an inch beyond the edge of the stain with a paddle stick or trowel. During the drying period of four hours the Oilrid absorbs the oil and turns into a fine white powder. The dry powder is then swept up, and the treated area is washed with ordinary soap and water.

Oilrid comes in an airtight container. A gallon of the moderately priced material cleans over six square feet of oil stain. (364)

● The Model "C" bulk material hauler offered by the Highway Equipment Company is designed for transporting and unloading nearly all materials of fine granular consistency, such as cement, flake gypsum, salt, pulverized lime, superphosphate, and others. The unit can be used at the job site for windrowing cement and lime material used in soil stabilization road work.

Four body lengths—8 ft., 11 ft., 13 ft., and 15 ft. are available. Capacities are from 50 to 80 bbl. A 30-in., heavy-duty, 4-ply rubber

belt-over-chain conveyor gives smooth flow of material to the discharge hopper. The screw-jack allows precision setting of the feedgate. Loads can be discharged within 6 to 12 min., according to the manufacturer. The unit is available as a power take-off or engine driven unit. (365)



● The Model R heavy duty torch, manufactured by Arcair Company, is considered ideal for any production application requiring high currents for maximum speed in metal removal. The unit provides six lines of current contact through its special alloy spring-action jaws. A concentric cable assembly provides greater current and air volume capacity. High temperature insulators are used to reduce maintenance cost and increase torch life.

The stainless steel shield and handle assembly and pistol grip give ease of handling and control. An adjusting knob permits the operator quickly to place the air blast in any location to permit the most comfortable operation. (366)

HELPS IDEAL CEMENT KEEP CLOSE CONTROL ON KILN BURNING . . . FROM 150 FEET!

Here's how Diamond Utiliscope Closed Circuit TV assures Ideal Cement of optimum kiln burning at their modern new Houston, Texas, plant: A Model 300 Utiliscope camera is mounted at the clinker discharge end of each of the plant's two 12 x 450 ft. wet-process kilns; lets the operator (in an air conditioned control room 150 ft. away) view 50 to 60 ft. of kiln interior from "load line" to clinker discharge point. Thanks to the Utiliscope system of remote visual observation plus a high degree of instrumentation, operators exercise precise control of production variables to insure highly uniform clinker.

Ideal Cement's Utiliscope systems are further evidence of Diamond Electronics' unique ability to design and build closed-circuit TV that provides reliable viewing under the Cement Industry's most brutal conditions (i.e. . . . the Utiliscope cameras at Ideal operate in ambients of 2100°F.!) Our engineers will be happy to demonstrate how Utiliscope can cut costs, improve product quality in *your* existing or proposed plant. For complete information, send us the coupon below.

Diamond Electronics

Division of Diamond Power Specialty Corporation

Diamond Electronics • Lancaster, Ohio

Please send complete information on how Diamond Utiliscope can help reduce operating costs and improve operations.

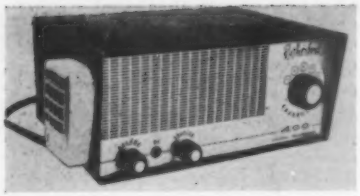
Name_____

Title_____

Company_____

Address_____

Enter 69 on card, page 217



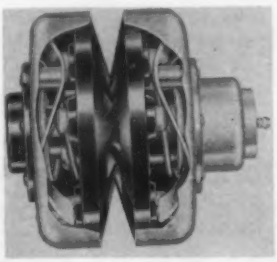
● The "R-400" citizens' band radiophone has been announced by Rutherford Electronics.

The unit is a transceiver featuring a high sensitivity receiver with three stages of amplification, automatic noise limitation, adjustable squelch, and a transmitter, all designed to meet F.C.C. requirements.

The universal power supply operates from 6 to 12 volts d.c., or 115 volts a.c. Six crystal-controlled receive and transmit channels are provided. A removable microphone with a press-to-talk switch operates the transmitter. The splashroof case withstands rigors of rugged mobile installations. **(367)**

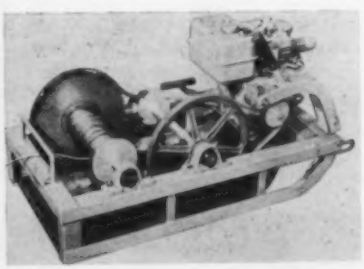
● A cam control designed to assure greater vari-speed efficiency is featured in a new series of wide V-belt pulleys offered by Hi-Lo Manufacturing Company, an affiliate of Lovejoy Flexible Coupling Company. The pulleys are rated at 1 to 5 hp. at 1,750 r.p.m., and provide instantly variable ratios of up to 3 to 1.

Each pulley face is independently actuated by its own spring and cam



assemblies. The opposite wedging action of each cam and cam follower prevents pulley spread, assuring constant speed, even under overload conditions.

Depending on the model the pulleys use No. 087, 12, or 14 top width variable speed belts. Standard bore sizes are from ⅝ to 1⅛ in. Maximum pitch diameters are 5.78 to 8.62 in., minimum pitch diameters are 1.875 to 2.87 in. Motor travel is 3⅛ to 4 in. Over-all dimensions are 5⅞ to 7½ in. long by 6 to 9 in. o.d. **(368)**



● The "Porta Winch," a portable winch engineered to supply winch power in hand to reach locations where heavier equipment cannot be used, is being offered by the Superior Manufacturing Company.

The Porta Winch fits into a station wagon or pickup truck, and is light enough to be handled by one man. Features include sled-type base, safety stop to prevent loss of load, welded anchor chain, self-adjusting clutch, steel cable roller. **(369)**

Tailor-made to give you more efficient blasting! **BEMIS EXPLOSIVES BAGS**

Bemis Explosives Bags for ammonium nitrate and nitro-carbo-nitrate are tailor-made to your requirements—to give you more efficient blasting.

More economical: Use of Bemis Explosives Bags and ammonium nitrate mixtures can save up to 50 percent on explosives costs.

Easy to fill: Bemis provides technical assistance, manufactures equipment to speed up bag filling.

Wet hole or dry hole . . . you'll get top efficiency at minimum cost with . . .

Bemis Burlap Bags with heavy-duty polyethylene liners. The rugged burlap absorbs the punishment of handling or jagged holes. Poly liner provides waterproofness.

Other Bemis Explosives Bags:

Flexiply® Bag with poly liner. Here three plies of rugged creped wet-strength kraft provide the toughness.

Laminated Bags. Constructions of burlap, kraft paper, polyethylene and pliofilm—in varied combinations—are all performing satisfactorily in the pits and on construction sites.

Write today for sample bags and additional information on Bemis Explosives Bags.

Bemis

Where packaging ideas are born

General Offices—408-Y Pine Street, St. Louis 2

Enter 70 on card, page 217

"TIMKEN® CARBIDE INSERT BITS AVERAGED 50% MORE FOOTAGE THAN EXPECTED"

Special report from Montag-Halvorson-McLaughlin & Associates

•

Location: John Day dam project on the Columbia River, 32 mi. from The Dalles, Ore.

•

Operating Conditions Lava-Basalt and Flo-Breccia

Accurate footage records show that Montag-Halvorson-McLaughlin & Associates of Portland, Ore., drilled over 3,000 feet per bit in abrasive Lava-Basalt and Flo-Breccia. Timken® bit quality, plus regular bit reconditioning and proper maintenance of drilling equipment paid off in 50% more feet per bit over original estimates.

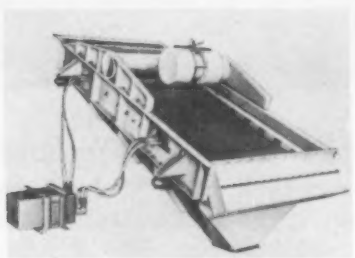
Which Timken Bit Should You Use?

Your most economical bit in hard, abrasive ground is the Timken carbide insert bit. In softer ground, use the low-cost Timken all-steel multi-use bit. They're interchangeable in the same thread series; you can switch bits as the ground changes. Dozens of Timken bits fit the same drill steel. Bit bodies are made of Timken electric furnace fine alloy steel, have special shoulder unions to protect against drilling impact. Let us help you select the right Timken bit for your job. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.

TIMKEN®
removable rock bits

● Two self-priming portable pumps have been added to the "Torrent" line manufactured by the Hale Fire Pump Company.

The 40-T (shown) pumps 40,000 g.p.h., and the 41T pumps 30,000 g.p.h. Both units automatically reprime extremely fast, even on high lifts. The manufacturer recommends the pumps for long continuous pumping under grueling conditions. (370)



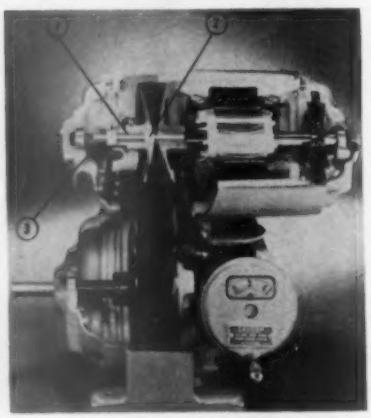
● Syntron Company announces the availability of its electromechanical vibrating screens equipped with electrically heated screen cloths. Seven models, in single or double decks, are available with screen surfaces of 3 by 5 ft., 4 by 6 ft., 4 by 8 ft., 5 by 10 ft., 5 by 12 ft., 6 by 12 ft., and 6 by 14 ft.

Syntron RVS electrically heated screens are especially applicable where there may be troublesome moisture content. The manufacturer reports the low-voltage-secondary transformer provides current for constant, uniform heat, resulting in the separation desired and elimination of blinding due to moisture.

The screen unit is activated by the RV vibrator—an integral motor vibrator—requiring a minimum of service or adjustment. The RVS screens are made up of a rigid, rectangular steel frame into which the screen dressing is mounted and to which the self-contained, unbalanced motor drive and vibration absorbing mounting supports are attached. (371)

● Variable speed drives developed by Sterling Electric Motors never require lubrication.

Three major lubrication spots, as shown in the picture, have been eliminated: 1. Keys are fabricated

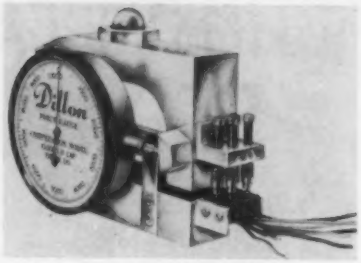


from tough elastic material to eliminate key and keyway wear; 2. Wear-resistant nonmetallic bushings require no lubrication; 3. Shaft surfaces are corrosion-proof and require no lubrication.

The drives are produced in ¼ hp. to 25 hp. with output speeds from 4,660 r.p.m. to .4 r.p.m., in speed variation up to 10:1. (372)

● A micro-switch force gauge manufactured by W. C. Dillon & Co. can be used to pre-set control switches to trigger motors, bells, lights, etc. at desired load points without the use of specialized calibrating equipment. It is available with up to 4 micro-switches.

The instrument can be set for permanent operation on automated production lines, or used in research and development laboratories for checking operational characteristics



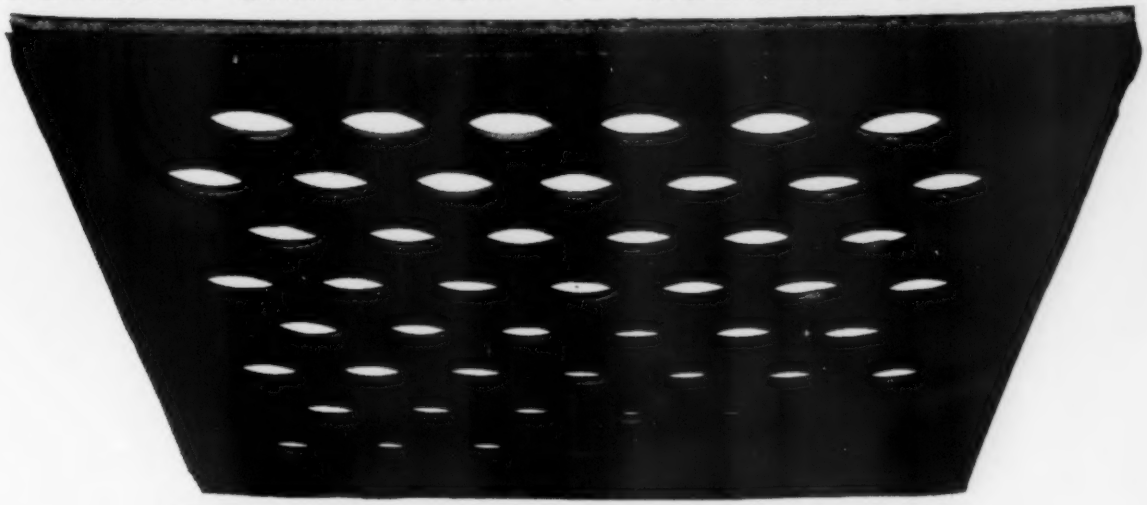
of equipment when varying mechanical forces are applied. Changing loads not only control job functions but can be visually read.

The gauges are available with 1 to 4 micro-switches in compression, tension, or push-pull models. Twelve capacities from 0-10 lb. through 0-50,000 lb. make up the complete line. (373)

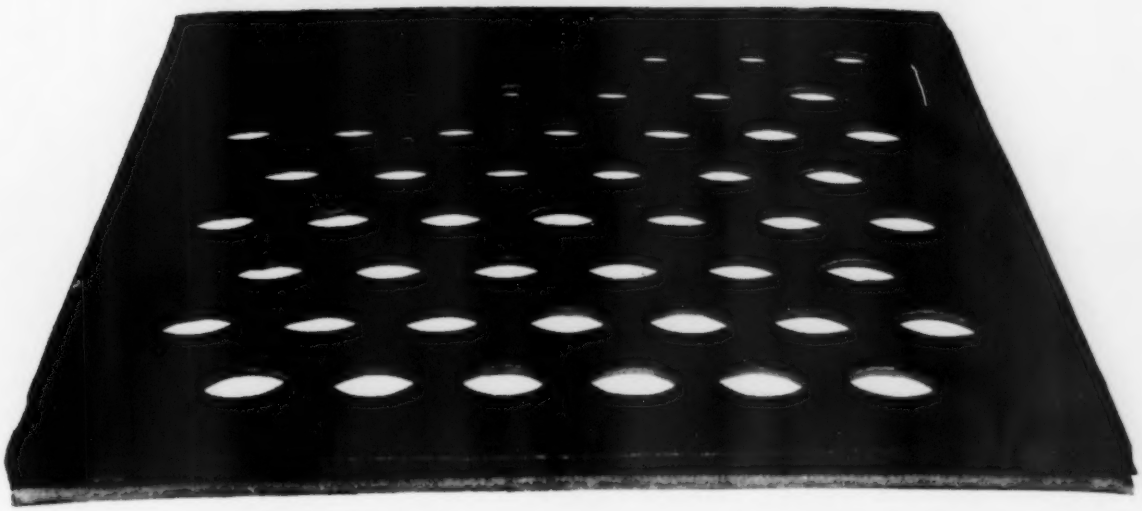
See
the lime and agstone insert beginning on page 100.

● Kennedy Van Saun is producing a new, completely hydraulic reduction crusher called the Kone-O-Matic for which the manufacturer reports advantages in secondary and tertiary operations. The crusher setting is automatically held in the set position by "Posi-trol." Varying setting is a one-hand operation. Crusher automatically rejects tramp iron without damage and returns at once to correct setting. (374)

SCREEN SANDWICH OF RUBBER ON STEEL



TAKES THE BITE OUT OF ABRASION COSTS



A specially designed rubber covering protects Hendrick Perforated Metal Screens by absorbing the abrasive action of ore, coal and stone. As a result Hendrick rubber-clad metal resists plate wear under extreme screening conditions. Rubber lasts longer because it is vulcanized under controlled heat and laminated to the steel by a new adhesive.

For more information about this unusual product, we invite you to contact your local Hendrick representative (he's listed in your Classified Telephone Directory under METALS, PERFORATED) or mail in the coupon.

HENDRICK Manufacturing Co.
Carbondale, Penna.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens
Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel
Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro Dehazers

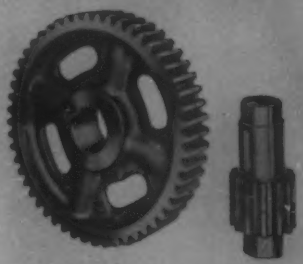
HENDRICK Manufacturing Company
Dundaff Street · Carbondale, Pennsylvania

Gentlemen: I want more information on Hendrick "Rubber-Steel" Screens.

☐ Please have representative call.
☐ Please send FREE literature.

Name_____
Title_____
Company_____
Street_____
City_____ State_____

Nordberg cone crusher gear.



Gear and shaft pinion.

you can save

Drive gear and pinion.

Cab roller.

THOUSANDS OF DOLLARS BY USING

Overhead crane gears and pinions.

Swing shaft bevel gear.

Ring bevel and shaft pinion.

Many of our customers in the Mining Industry both here and abroad, have already done so, in replacement cost savings alone. Ordinary untreated products simply cannot compete with "Tool Steel Process" hardened products in wear resistant qualities. TSP hardened products have a phenomenal long life. They seldom need to be replaced because of wear or breakage. They carry an exclusive written guarantee stating they will outlast any other product in the same service. All TSP products are hardened by our special process. The file hard surface to full depth of permissible wear gives maximum life. The core, refined for toughness and ductility, gives maximum strength. They are made to order from your blueprints. Gears are made in sizes up to 90" diameter. Other products up to 20,000 lbs. weight. Our representatives are located all over the world and are equipped to offer complete service. Simply write us direct for all necessary information, technical bulletins, etc.

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THE TOOL STEEL GEAR & PINION COMPANY

CINCINNATI / OHIO / USA

the standard of quality since 1909 for gears • pinions rolls • wheels and other hardened products.

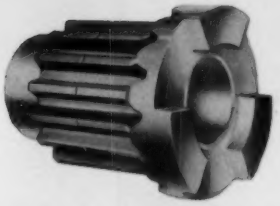
Ad No. 1054

Printed in U.S.A.

Bottom roller.

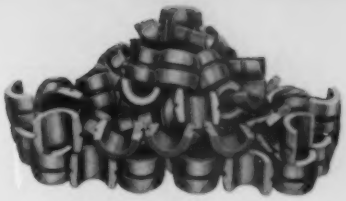
Drive gear and pinion.

Brake wheel.

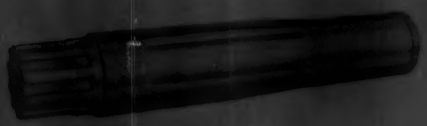


Dragline walking pinion.

Rope drum.



Half bearings.

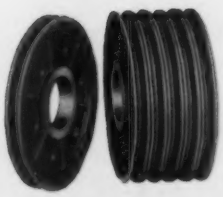


Rotating shaft.

Drive pinion.

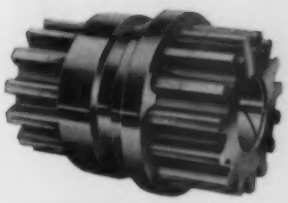
Bevel gears.

THESE TSP HARDENED PRODUCTS

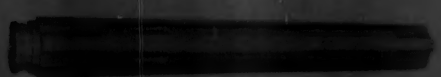


Sheave wheels.

Shipper shaft and pinions.



Drive pinions and clutch.



Vertical swing shaft.

Horizontal swing shaft pinion.

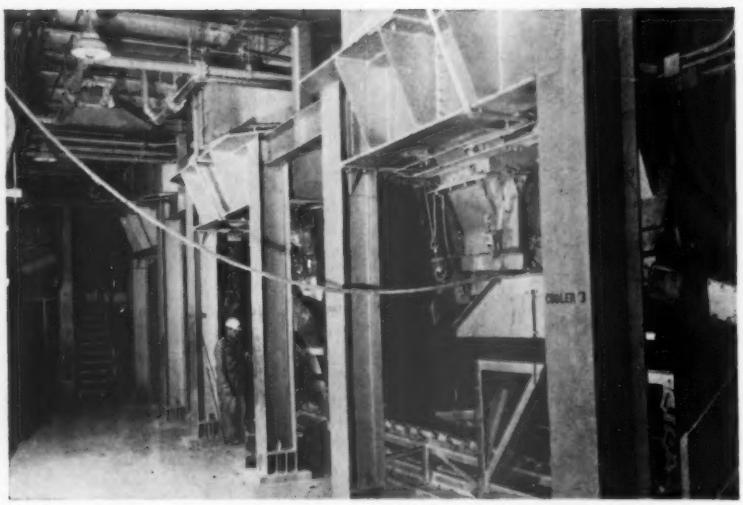
Trunnion rolls.

Bevel pinion.

Swing shaft pinion.

Loading machine bevel gear.

Jeffrey processing equipment assures accurate controls in lime plant



Sixteen Jeffrey vibrating feeders draw burned lime from the four kilns for further processing.

Finished lime, feeding from silos onto this Jeffrey HMV conveyor, is blended to suit customers' needs.

Strategically located in the Flats at Cleveland, this Cuyahoga Lime Company plant makes burnt lime immediately available to the two oxygen steel-making plants it serves. As those facilities are increased, the layout here allows for expansion to meet demands.

Sixteen Jeffrey 18" x 38" vibrating feeders are installed; four feeders serve each of the four kilns; all have electronic amplitude control for precise metering of burnt lime for further processing. It passes through an adjustable Jeffrey double roll crusher, after which the lime is stored in three silos according to size.

A Jeffrey HMV conveyor, 71' 6" long and completely enclosed to make it dustproof, runs along under the three silos where the finished lime is stored. Here various sizes are proportioned and blended to meet customers' requirements.

The Jeffrey Manufacturing Company, 917 North Fourth St., Columbus 16, Ohio.

If it's conveyed, processed or mined, it's a job for Jeffrey.

JEFFREY

Washington News

(*Concluded from page* 11)

was higher in January than at any time during 1960. The silver lining, insofar as there is one, is that the proportion who reported increases continues to be greater than the proportion reporting decreases.

Construction Industry's Prospects For the construction industry, which has played so large a role in previous business cycle movements, the outlook is neither dull nor brilliant. Plant outlays in durable goods manufacturing are likely to continue to fall; in nondurable goods manufacturing, they are likely to rise. Home construction is expected to rise, but the consumer buying intentions survey raises questions as to whether there will be customers for them.

All told, the picture is a mixed one everywhere. There is little solid basis for the confident prediction. But, there is much confidence abroad. If this is not shattered by some unforeseen event, this very confidence may turn a *possible* boom into a *real* one.

Labor Developments

(*Concluded from page* 13)

Chairman of the National War Labor Board (World War II) and of the National Wage Stabilization Board during the Korean crisis; he is currently the chairman of a committee which is working in one relatively obscure segment of the steel industry which may, if successful, revolutionize the pattern of collective bargaining, strikes, and strike settlements in that industry.

It will be remembered that, when threatened with an injunction, the Kaiser Steel Corporation broke away from the rest of the industry and made a separate settlement which terminated the recent strike. As a part of that settlement, the Long-Range Committee, headed by Dr. Taylor, was created. This group also includes David Cole and Dr. John T. Dunlop as public members, together with three representatives respectively from the employer and the union.

A recent report of that committee indicated agreement to broaden its purposes, obviously in an attempt to facilitate agreement and avoid a repetition of past costly conflicts. To accomplish this, it has been agreed that if necessary the Long-Range Committee shall be convened not later than 30 days prior to the expiration of the current agreement and shall review the status of negotiations.

Upon the basis of this review, the public members of the committee shall then be authorized to take any one or all of the following steps:

(a) Determine to take no action or to postpone action until there has been an opportunity for further bargaining;

(b) Attend the bargaining sessions as observers;

(c) Engage in mediation efforts, including private consultation with representatives of each of the parties;

(d) Issue a private report to the parties summarizing their respective positions, defining the issues in dispute, and making recommendations to the parties; and, finally

(e) Issue a public report, either prior or subsequent to the contract termination date. The public members shall not release a public report until the company and union have had every reasonable opportunity to come to an agreement.

This is a forward-looking attempt to avoid crisis government intervention such as has become habitual in steel industry settlements.

It would be no surprise to find the President's Advisory Committee on Labor-Management Policy advising the United Automobile Workers and the Big Three automobile companies to try out some similar arrangement before they threaten the nation with a serious strike. If advice of this nature is accepted, Secretary Goldberg has a chance of succeeding in his work.

Workers were called back to the Cementon, N. Y., plant of Alpha Portland Cement Company on March 13. The resumption of work marked the end of a shutdown which began on February 6. About 200 employees were involved.

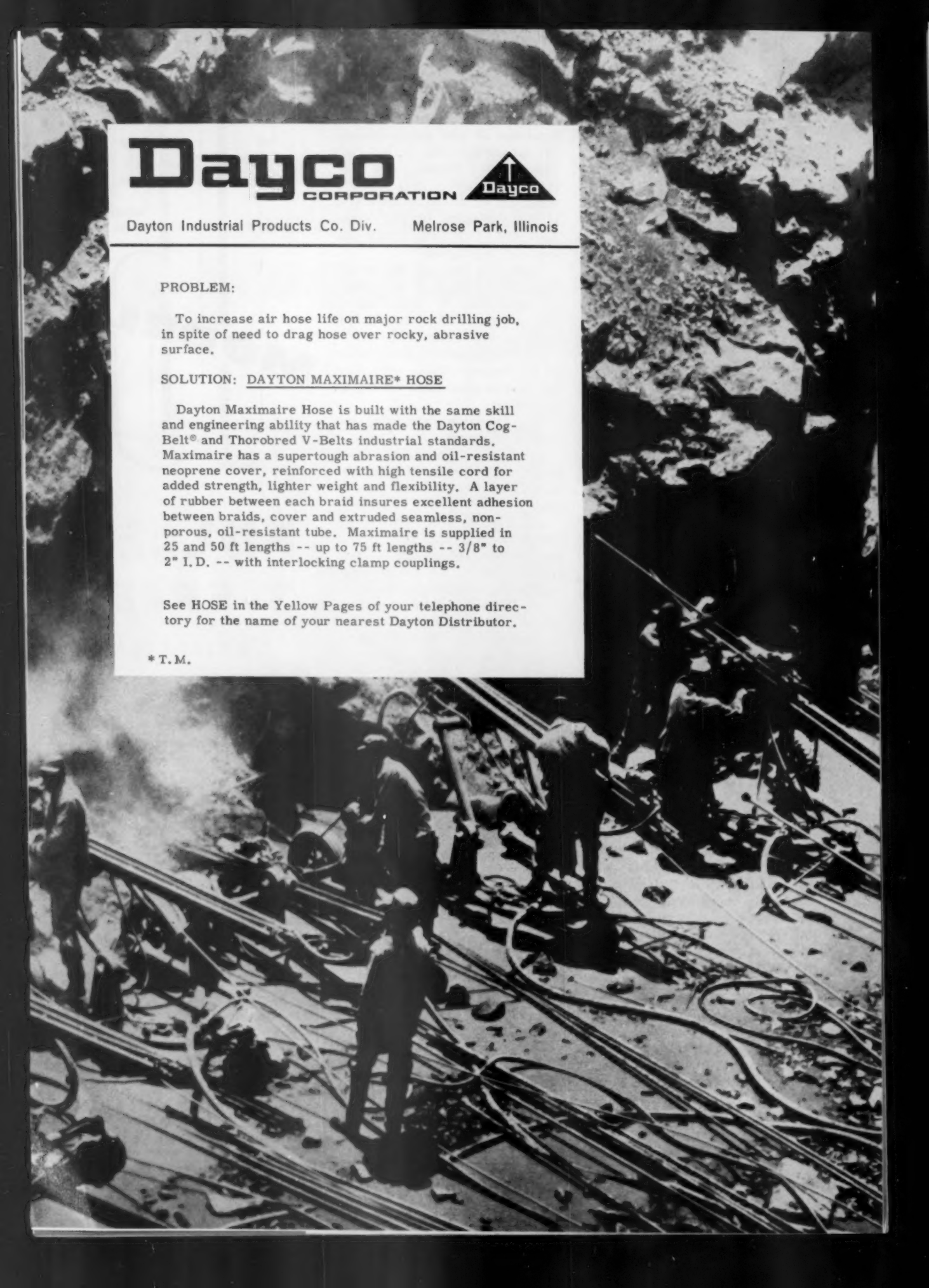
16 MODELS of FULLER 3-SPEED AUXILIARIES

Specify FULLER...
Specify the MODEL
Get the 3-speed auxiliary designed for your job.

HIGH CAPACITY . . . WIDEST RANGE OF RATIOS . . . OPTIONAL TOP-MOUNTED POWER TAKE-OFF . . . LOW INITIAL COST, LESS MAINTENANCE . . . AVAILABLE FROM ALL LEADING TRUCK MANUFACTURERS ON SPECIFICATION

Specify the MODEL
Choose from 16 Models of FULLER Three-Speed Auxiliaries

FULLER TRANSMISSION DIVISION
EATON MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Enter 77 on card, page 217



Dayco CORPORATION

Dayton Industrial Products Co. Div. Melrose Park, Illinois

PROBLEM:

To increase air hose life on major rock drilling job, in spite of need to drag hose over rocky, abrasive surface.

SOLUTION: DAYTON MAXIMAIRE* HOSE

Dayton Maximaire Hose is built with the same skill and engineering ability that has made the Dayton Cog-Belt® and Thorobred V-Belts industrial standards. Maximaire has a supertough abrasion and oil-resistant neoprene cover, reinforced with high tensile cord for added strength, lighter weight and flexibility. A layer of rubber between each braid insures excellent adhesion between braids, cover and extruded seamless, non-porous, oil-resistant tube. Maximaire is supplied in 25 and 50 ft lengths -- up to 75 ft lengths -- 3/8" to 2" I.D. -- with interlocking clamp couplings.

See HOSE in the Yellow Pages of your telephone directory for the name of your nearest Dayton Distributor.

* T.M.

U.S. Gypsum's "Countess" Has Unusual Unloading Setup

When the *S. S. Gypsum Countess* of United States Gypsum Company made a stop in Jacksonville, Fla., on her maiden trip, enough gypsum rock was unloaded to supply this area's rapidly-growing construction industry with building products needed for 2,600 average-size homes.

The Countess, newest member of a fleet of five big self-unloaders that regularly visit Jacksonville, carried a cargo of 11,000 tons of gypsum rock.

United States Gypsum is keeping pace with the need for home-building materials in the Jacksonville area by speeding up production at its plant in this city. The expedited operations require additional stops of company-operated ships delivering gypsum rock from Nova Scotia and Jamaica. Each trip means more business for local tug boats which dock the ships and more purchasing of supplies locally.

Gypsum rock is transferred from ship to shore in 8 to 10 hours at a rate of more than 1,000 t.p.h. In the unusual unloading procedure a boom conveyor is first extended to the ship. This coupled boom moves up and down, fore and aft, with the ship's roll. The hook-up takes only 5 to 10 minutes.

Two long rows of gates within the ship's hull, activated by push-button, control the feeding of rock from the twin-troughed cargo space onto two parallel conveyors. The latter, running lengthwise with the vessel, carry rock onto a cross belt at the stern. The 32-in. wide electrically-interlocked belt transports the raw material to a storage shed.

In the shed, another belt cuts into the main conveyor and diverts some of the load to an outdoor stockpile. This gypsum rock is held in reserve in case a ship's arrival is ever delayed. Most of the rock, however, is distributed in piles above a series of vibrating rock feeders which supply rock to a conveyor running through a tunnel beneath the shed and into the plant.

Unloading requires no manual operation. If any part of the belt should stop, the entire system would shut off automatically. The five self-unloading ships serve U. S. Gypsum's East Coast plants.

Gypsum rock being unloaded from the COUNTESS onto a cross belt at the stern of the vessel. This belt leads into a feeder which drops it down to the main conveyor and carries it along the pier to the storage shed.

THE COUNTESS, newest of five self-unloaders carrying gypsum rock built for U.S. Gypsum, was launched last August at Le Trait, France. Its loading berth is Hantsport, Nova Scotia.

North American Refractories Begins Production of New Line

North American Refractories, Cleveland, Ohio, has begun production of a full line of basic refractories at its plant in Womelsdorf, Pa. The line will be marketed under the trade name of NARMAG in the following categories: magnesite, magnesite-chrome, chrome-magnesite, and chrome. The products will be chemically bonded and burned in either plain, metal encased, or metal cased and internally plated types. Companion basic specialities —plastics, castables, and mortars— will also be produced.

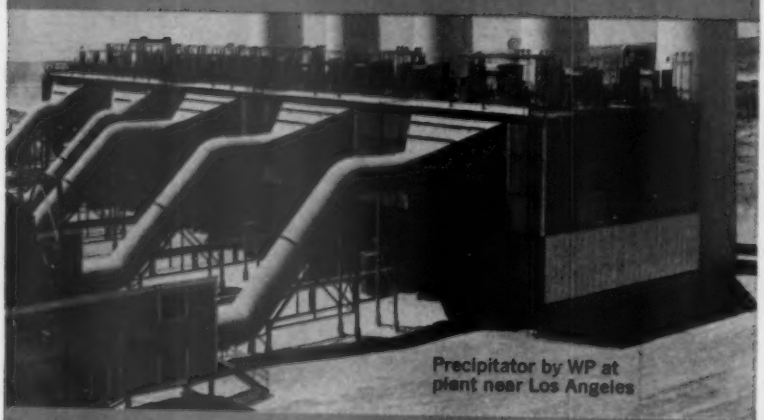
The new line is in addition to the firm's silica and clay refractories.

A technical services department was also formed to assist in the specification and application of refractories to customers' needs.

← Enter 78 on card, page 217

Therm-O-Flex filter by WP at plant in Barberton

Cement makers in Ohio... and in California...agree:



Precipitator by WP at plant near Los Angeles

When DUST is your problem— CLEAR IT WITH WP*

For an efficient, economical solution to any dust control problem—look to Western Precipitation. WP is uniquely fitted to handle your unique problem—being the one organization that custom designs, engineers and installs ALL types of dust and fume control equipment: Precipitator, Mechanical, Jet-Cleaned Filter, Hi-Temp Filter, scrubbers and engineered combinations.

With no axes to grind for any one system, WP engineers will give your job a completely unbiased recommendation—whether it's a quote on your specifications, a single component, or a completely engineered installation... small, major, simple, or complex.

An inquiry—on your business letterhead—will bring you literature promptly. Just write Western Precipitation, 1000 W. 9th St., Los Angeles 54, Calif. (In Canada, write 8285 Mountain Sights Ave., Montreal, P.Q.)

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Division of Joy Manufacturing Company

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DUALAIRE Jet-Cleaned Filters
THERM-O-FLEX Hi Temp Filters

TURBULAIRE Scrubbers
JOY-MICRODYNE Scrubbers
also: **HOLO-FLITE** Processors
HI-TURBIANT Heaters
TURBULEX Calciners

We've got an explosives expert on our staff at no extra cost...

Every Austin customer can make this statement!

Austin representatives offer *more* than a complete line of explosives and blasting supplies. They provide supporting technical information vital to your efficient use of these products.

Each Austin representative is qualified by education, training and experience to recommend the most effective explosive . . . most economical method of blasting . . . correct blasting supplies . . . best storage and handling facilities . . . everything needed for best results.

Also available is knowledge contained in countless case records compiled by Austin technical representatives during the company's 128 year history. These list patterns, burden, water conditions, and the explosives recommended. By comparing latest techniques with past experience, guesswork can be virtually eliminated.

Your job may require a special mixture. Here, too, your Austin representative always proves invaluable, for he will employ services of the Austin research and manufacturing departments to develop practical solutions to your problems.

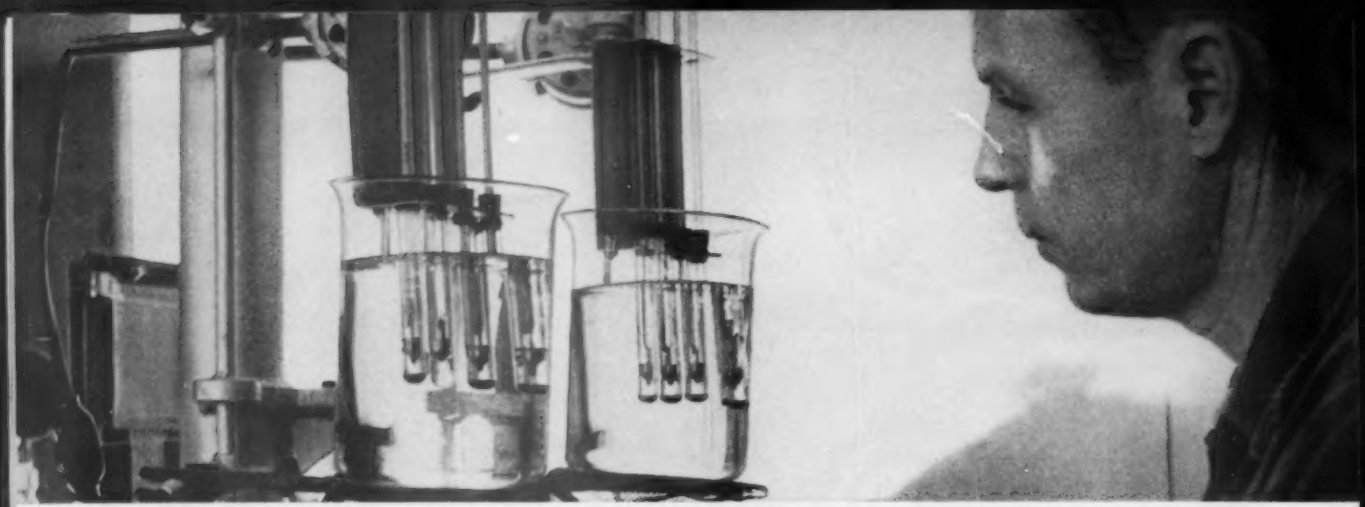
It's easy to put an explosive expert on your staff at no additional cost.

Call your Austin representative today.

USED IN 1833 AUSTIN & EVER SINCE

AUSTIN POWDER COMPANY

Cleveland 13, Ohio



Dropping point test shows how greases react to heat. Beaker fluid has been heated to 390° F. All greases tested except Darina (second tube from left) have passed from solid to liquid state.

BULLETIN:

Shell reveals the remarkable new component in Darina Grease AX that helps it last up to 3 times longer than soap-base greases

Darina® Grease AX is made with Microgel*, the new thickening agent developed by Shell Research.

Severely tested for 18 months, Darina AX with Microgel proved its ability to resist washout, even in mud and slush—stay smooth and buttery at high temperatures—and reduce maintenance.

Read how this superior new multi-purpose grease can help solve your lubricating problems.

THERE IS no soap in Darina Grease AX. No soap to melt away—wash away—or dissolve away.

Instead of soap, Darina AX uses Microgel—a development of Shell Research.

What Microgel does

Because of Microgel, Darina AX has no melting point. It won't run out of bearings.

Even compared to soap-base greases, Darina AX provides significantly greater protection under adverse service conditions.

Resists washout

Mix water into Darina AX and the grease maintains its consistency. It shrugs off water—won't emulsify. For fleets that must operate in snow, slush, rain or mud—Darina AX is an ideal choice.

Longer lubrication life

Shell scientists tested Darina AX, under wet conditions, in a special device called an Oscillating Friction Machine.

Darina AX kept its lubricating qualities twice as long as a premium soda soap-base grease; 2½ times longer than a calcium-soap grease; 3 times longer than an aluminum-soap grease.

Results of field test

In a recent field test, 15 firms used Darina AX in chassis and wheel bearings of over 1000 vehicles. These buses, trucks and vans rolled up 30,097,000 chassis miles. The results:

1. Every company was pleased with the performance of Darina AX.
2. There wasn't one wheel bearing failure due to grease deficiency.
3. In many cases, re-lubrication schedules could be extended.

For details, see your Shell Representative. Or write: Shell Oil Company, 50 W. 50th St., N. Y. 20, N. Y.

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SHELL

A BULLETIN FROM SHELL
—where 1,997 scientists are helping to provide better products for industry

The Editor's Page

Water — a Disappearing Natural Resource

THE strength and prosperity of this nation have been due as much to our tremendous natural resources as to any other one thing. In the early years supplies of land, timber, and water seemed limitless. As this country grew, however, there was too little regard for the future, and one by one our natural resources were wasted away until some of them are now gone beyond recovery.

In the nonmetallic minerals field we have worked out many of our best and most accessible deposits and are now forced to more expensive recovery and treatment methods. Along with the metal and coal industries we have also left behind vast waste areas, some of them almost impossible to reclaim.

During our entire history there has always been one natural resource, and that perhaps our most important one, which we have been sure would always be in ample supply for the nation as a whole. Gradually, however, we allowed our rainfall to run off to the sea, we drained our wells dry, and we polluted our lakes and streams until many of them are now unusable for any purpose. Only in recent years have serious steps been taken to stop this waste.

THE fact that waste is the largest single threat to our water resources was the theme of a 16-page booklet entitled *Water Bill U. S. A.*, published a few months ago by the Caterpillar Tractor Company as a public service. It was pointed out that in a growing number of areas our supplies of water no longer meet our demands. Many communities are now forced to ration water, some of them the year around, and it is estimated that a quarter of the nation has inadequate or poor-quality supplies. Factories dependent on water have been forced to close, slowing the economic life in their communities virtually to a standstill. Taxes rise as cities must drill deeper wells or pipe water in from more distant sources.

THE water problem, as it affects the country as a whole and the nonmetallic minerals industries in particular, was the subject of several important papers presented before the recent convention of the American Institute of Mining, Metallurgical and Petroleum Engineers in St. Louis, which is reviewed in this issue. Our water problem, it is stated, is much more serious than earlier studies have indicated, due to the unexpectedly rapid increase in our population and to the expansion of our economy. Expansion of our water retention and storage facilities is recommended, but more essentially, better management of these facilities and of water use. Potential savings through the re-use of water by industry were particularly emphasized. Given as an example was one large industrial facility which by practicing recirculation requires as makeup water only 2 percent of its former fresh water consumption.

Nearly every industry, including most of those in the Pit and Quarry field, can help to solve this problem by intelligent use and re-use of water, and by eliminating pollution. Individuals can also help by initiating and participating in community action to conserve water supplies and solve water problems.

Walter E. Trauffer

← Enter 82 on card, page 217

BASIC FACTORS IN

Protecting Close Corporation Stockholders

This is the fifth and final article on Employee and Executive Benefit Programs prepared with the co-operation and assistance of Donald Shepherd and Company, Inc., Benefit Plans Consultant to the National Sand & Gravel Association, National Ready Mixed Concrete Association, National Industrial Sand Association, and National Concrete Masonry Association.

This article is a discussion of the closely held corporation, the form under which most companies in this industry operate. The discussion will be divided into two parts: first, the distribution of stockholders' interests in event of death; and second, deferred compensation for executive and key employees.—The Editors.

DISTRIBUTION OF STOCKHOLDERS' INTERESTS

A CLOSE corporation is one in which the stock is closely held by a very few people. In the case of small businesses management and ownership are apt to be synonymous. This is particularly true in this industry, in which those who own the business are also the active managers. It is well, perhaps, to discuss here how a corporation is formed.

The corporation is an artificial entity which is created under the specific laws of the various states. In the creation of the corporation, it must be registered with certain formalities, depending upon the state in which the business is incorporated. Once the course has been set, it does not depend upon any individual for its continued existence. It is an entity in and of itself. It is taxed as though it were a separate being and is so regarded by law. In this respect, it varies from a partnership or a sole proprietorship.

If two men in this industry were operating as a partnership, they would have created little more than joint ownership of some property and perhaps a company name and a set of books. Were these same men to incorporate the business, they would create in addition to these other things, a separate being —a close corporation.

One of the reasons for incorporating is that the limits of the liability of the owners are set, as the sole liability would be that incurred by the corporation itself and, therefore, would not place the personal assets of the individual stockholders in jeopardy.

One important distinction between the owner of a corporation and that of some other business entity is the fact that the number of shares held by each stockholder-owner represents his proportionate interest in the total ownership of the business. Currently the basic Federal Corporate Tax rate is 30 percent on the first $25,000 of corporate earnings and 22 percent surtax on all taxable income over the first $25,000. The distribution of corporate profits may be made in several different ways:

1. They may be distributed as dividends. However, before the payment of dividends, profits allocated for this purpose are subject to the appropriate corporate tax. Upon payment of dividends, they then would become subject to personal income tax to the recipient. Thus a double current tax would be effective.

2. Profits might be added to surplus, to the extent that they were reasonable additions, and only the corporate tax would be currently payable.

3. As we have assumed that our stockholders in this closely held corporation are also employees of the corporation, it is usually advantageous to the stockholders to set a salary in an amount so that the profits will be payable in this manner, rather than being added to the surplus of the corporation or paid out as a dividend. Profits distributed as salary or bonus are tax deductable by the corporation, provided that they are reasonable in amount.

While a stockholder-employee is living, his share of stock will indicate his proportionate ownership and thus give an indication of the amount of profits he may expect to receive from the corporation. These profits from a practical standpoint, are usually paid in the form of salary or bonus.

Problem Created by Death of Stockholder

This share of the profits while the stockholder-employee is living is one thing; but it does not neces-

sarily follow that there would be an equivalent valuation upon his death. In a strictly legal sense, the death of a corporate stockholder-employee has no effect on the business entity itself, and his stock interest passes on to his estate. It is one thing to state that there may be no legal effect on the continuity of the corporation. However, there are many factors involved beyond the *legal* aspects.

In the usual closely-held family corporation, in which management and ownership are one and the same, the business may well lose its most important asset through the death of the key employee. Therefore, while the operation of the business as a corporation is not affected, it may suffer a substantial loss. If the deceased stockholder owned the majority of the stock in the corporation, the surviving stockholders could well find themselves in an almost untenable position because the voting power would then be held by the estate of the deceased stockholder; and the knowledge and interest could be considerably different from that of the surviving stockholders.

While the situation may be a difficult one for the surviving stockholders, the heirs of the deceased employee may have an even more serious problem. As we have indicated above, in the small, closely-held corporation, dividends in all probability have never been paid; or, if they have, they have been small. Therefore, the heirs are faced with control of a business about which they may have little or no knowledge.

The surviving stockholders have a number of choices:

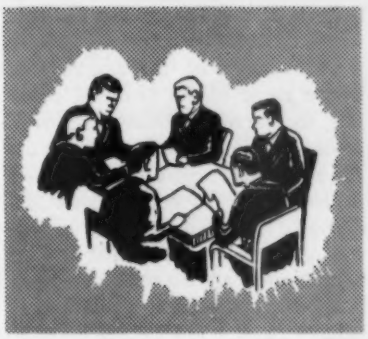
1. They may work with a co-stockholder to whom the executors of the deceased stockholder's estate may sell his stock.

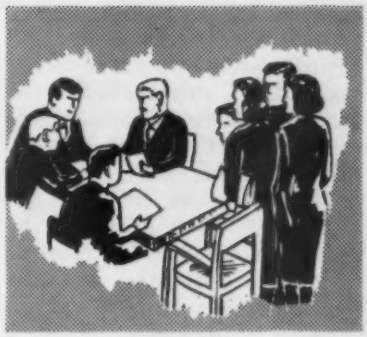
2. They may sell their stock interest to the estate of the deceased or to some other party.

3. They may buy out from the estate of the deceased stockholder his stock interest.

4. They may continue to operate the business with the estate of the deceased stockholder as a co-stockholder.

In looking at each of the possibilities faced by the surviving stockholders, we find that, in the first instance, they are dealing with someone who may or may not be compatible or with someone who may or may not have the necessary knowledge and skills in the business. They may even be dealing with a competitor.





The heirs of a major stockholder may be facing a problem more serious than that of the surviving stockholders.

In the second instance, it may be almost impossible to arrive at an agreement as to price; and through such a sale, the survivors in all probability, would find themselves out of a job.

The third choice may mean raising a substantial sum of money; and it is difficult to arrive at an agreement as to price equitable to both the surviving stockholder and the estate of the deceased stockholder.

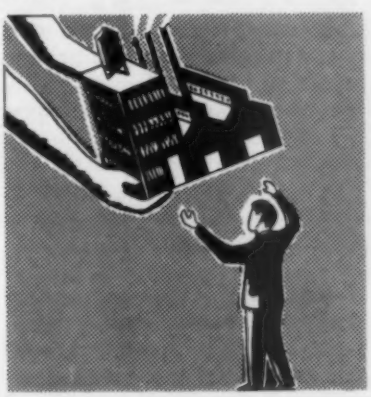
The fourth choice may be a very untenable one from a practical standpoint as the estate of the deceased stockholder would have a majority interest, and the surviving stockholders probably would be unable to operate effectively.

The Solution What then is the solution to the problem? Actually, the solution is a relatively simple one.

The stockholders in a closely held corporation may enter into a stock purchase or stock retirement agreement with each of the other stockholder interests. Such an agreement would obligate the heirs to sell the stock to the survivors and would further obligate the surviving stockholders to buy the stock from the estate of the deceased stockholder. In such an agreement, a definite price would be set for the stock; or in lieu of this, a formula would be developed for establishing a price.

In setting up such an agreement, it is obvious that some sound method must be found to finance the purchase of the stock of the deceased stockholder, so that there will be an adequate amount of money available for the survivor-stockholders to make payment to the estate. The best method of covering the contingency of the death of a stock-

Through a stock purchase agreement the control exercised by the deceased stockholder passes to his associates, who assume full control upon making an agreed cash settlement with the heirs.



holder would appear to be through the use of life insurance representing the approximate value of the stock interest. There are several collateral values which may accrue to the closely-held corporation through the acquisition of such life insurance on its stockholder employees.

The cash values of this life insurance at all times represent an asset of the corporation and therefore enhance the credit of the corporation. In the event of the death of the stockholder, it tends to establish a valuation usually acceptable to the Treasury Department as a realistic valuation of the deceased's interests and it further provides to the survivor-stockholders full ownership of the business without any financial encumberances.

It is obvious that the only sound solution to both the estate of the deceased stockholder and to the surviving stockholders is a stock purchase agreement. Further, the stock purchase agreement will provide maximum effectiveness only if proper funding is provided to carry out the terms of the agreement.

Situations vary within different corporations, and it requires a careful analysis of each corporation to determine the best method of setting up a stock purchase agreement. Let us consider the following:

S. & G. Corporation employed 200 people, and its stock was owned by two men. As a growing corporation, its need for expanding facilities left little cash liquidity. It was the wish of each of these men that in the event of the death of either one, the survivor would retain ownership of the business and the deceased's estate would receive a cash settlement for his stock interest. Because of the company's cash position, it was imperative that any arrangement made to solve the problem be made without a heavy cash outlay.

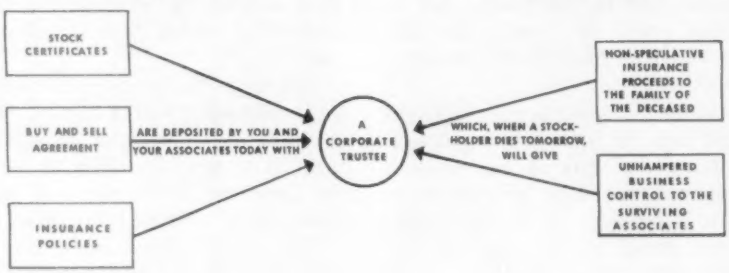
A solution was worked out in the following means: A stock purchase agreement was made, and cash to finance the purchase of the stock was provided through life insurance on the two stockholders, insurance to be owned by the corporation. Upon the death of one of the stockholders the insurance is payable (tax free) to the corporation, thus providing the cash needed to buy the deceased's interest.

This plan makes it possible for the deceased's family to get full value for the stock, and the surviving stockholder is left the business without any financial obligation which would have been due if cash had not been provided.

The two owners found not only that the cost to the company was relatively small, but its credit standing was improved, and both stockholders were able to complete arrangements for their estates.

A recent study indicates that failure to have a buy-and-sell agreement which establishes a stock value for federal and state tax purposes may force a family to spend more than five years in court after the stockholder's death—5.5 being the average length of time required to establish the final valuation of corporate stock. (See chart below.)

SOLUTION TO THE PROBLEM WITH INSURANCE OWNED BY THE CORPORATION


STOCK CERTIFICATES
BUY AND SELL AGREEMENT
INSURANCE POLICIES
ARE DEPOSITED BY YOU AND YOUR ASSOCIATES TODAY WITH
A CORPORATE TRUSTEE
WHICH, WHEN A STOCK-HOLDER DIES TOMORROW, WILL GIVE
NON-SPECULATIVE INSURANCE PROCEEDS TO THE FAMILY OF THE DECEASED
UNHAMPERED BUSINESS CONTROL TO THE SURVIVING ASSOCIATES

KEY PERSONNEL DEFERRED COMPENSATION

In a previous article we discussed formal pension and profit-sharing plans and the advantage which accrues to a corporation and its employees by the adoption of such plans.

While these plans help to solve the retirement problems of the average employee, qualified pension plans may not provide adequate retirement income for key personnel. Key executives very often have a real retirement problem, as in these days of high income tax, it is almost impossible to accumulate sufficient cash to provide the retirement income necessary to maintain the standard of living to which they have become accustomed.

Deferred Compensation Plan Today, many employers recognize this problem and have made effective what a known as a "deferred compensation plan." Under this arrangement compensation is deferred to a later date and at a time when a key executive would not be in as high a tax bracket. Many such plans provide not only retirement income for these employees but also a continuance of a portion of the employee's income for a period of time to his family in the event of his death prior to retirement.

Advantages to the Employer From the employer's standpoint, a deferred compensation plan gives the assurance that the valued key employee will stay with the company, thus making available the value of his executive ability and knowledge for the continued growth of the company. Under most such plans, the employee's right to receive the deferred benefits is based upon the condition that he will remain with the employer until retirement and that, further, he will not make his services available to a competitive company until retirement.

The deferred compensation plan not only keeps a key employee with a company, but is often a means of attracting key executive personnel. Whether the purpose in setting up a deferred compensation plan is to attract new personnel or to retain present personnel, the

employer usually finds that he has provided benefits which, in the long run, will cost the company considerably less than an increase in the executive's salary.

Advantages to the Employee From the employee's standpoint, such a plan usually enables him to get much more for his years of service with his company than would be true from a salary increase.

Planning a Deferred Compensation Plan A deferred compensation plan should be designed to provide the utmost in benefit to both the employer and the employee. Therefore, it is important that consideration be given to the individual needs and desires of both. While there are many different kinds of deferred compensation plans, the plans in general provide for a specified amount of compensation to the employee and prescribe some definite employment conditions.

A typical form of employment contract is one in which the *key employee* agrees (1) to continue in the employ of the company for a definite number of years; (2) to assure the employer that his services will be available to the company for consultation purposes during retirement; and (3) not in any way assist a competitive company during retirement.

Under a typical deferred compensation plan, an employee would usually lose all of his rights in the contract if his employment were terminated before he retired.

The *employer,* or company, agrees (1) to retain the executive in his present status and at a salary agreed upon; (2) to provide for the executive an amount of deferred income commencing at retirement age, for some specified number of years or for life; (3) to provide a death benefit to the key employee's family (such benefit to be a percentage of salary) for some specified number of years if the executive should die after retirement; and (4) to provide a death benefit to the employee's family if the executive should die before retirement.

Separate contracts may be arranged for each key employee with special provisions to cover special situations.

Once a company has established a deferred compensation plan for its key employees, arrangements should be made to provide a funding method. The deferred compensation plan involves an obligation which the company will have to face sometime in the future. The future begins at any time from tomorrow on, if the employee should die, or at its maximum at the time of retirement of the key employee, which might be 20 or 25 years hence.

When management makes a capital expenditure for operating equipment, it depreciates this equipment and normally sets up a reserve to cover its replacement cost. Is a key employee of less value than a piece of equipment? It is equally important to set up reserves to cover the future liability of the deferred compensation plan.

In many companies it has been found that life insurance contracts not only cover the liability which might accrue tomorrow; through the reserves which are built up in the insurance contract, they also provide the wherewithal for the retirement benefits required under the deferred compensation contract. If insurance is used for this purpose, the insurance policies should be owned completely by the *corporation;* and their values could be used to pay all or a part of the deferred compensation benefits.

The cash and death values of the policy are not a part of the deferred compensation agreement as such; they become a part of company surplus and, therefore, would be available for carrying out the

(*Concluded on page 92*)

$100,000 INSURANCE PROTECTION FOR PRINCIPAL CORPORATE OWNER

Annual Deposit — $2,884 **Age 41**

Age	Net Annual Deposit	Total Deposit to Date	Liquidation Value	Cost	Average Yearly Cost	Tax Free Death Benefit	Total Death Value
41	2,884.00	2,884.00	1,185.00	1,699.00	1699.00	100,000	101,185
42	2,677.00	5,561.00	3,590.00	1,971.00	985.00	100,000	103,590
43	2,621.00	8,182.00	6,014.00	2,168.00	722.00	100,000	106,014
44	2,566.00	10,748.00	8,056.00	2,692.00	673.00	100,000	108,056
45	2,517.00	13,265.00	10,114.00	3,151.00	630.00	100,000	110,114
46	2,474.00	15,739.00	12,187.00	3,552.00	592.00	100,000	112,187
47	2,435.00	18,174.00	14,272.00	3,902.00	557.00	100,000	114,272
48	2,404.00	20,578.00	16,370.00	4,208.00	526.00	100,000	116,370
49	2,379.00	22,957.00	18,476.00	4,481.00	497.00	100,000	118,476
50	2,360.00	25,317.00	20,590.00	4,727.00	472.00	100,000	120,590
51	2,350.00	27,667.00	22,710.00	4,957.00	450.00	100,000	122,710
52	2,352.00	30,019.00	24,833.00	5,186.00	432.00	100,000	124,833
53	2,360.00	32,379.00	26,957.00	5,422.00	417.00	100,000	126,957
54	2,378.00	34,757.00	29,081.00	5,676.00	405.00	100,000	129,081
55	2,405.00	37,162.00	31,202.00	5,960.00	397.00	100,000	131,202
56	2,440.00	39,602.00	33,317.00	6,285.00	392.00	100,000	133,317
57	2,486.00	42,088.00	35,424.00	6,664.00	392.00	100,000	135,424
58	2,544.00	44,632.00	37,521.00	7,111.00	395.00	100,000	137,521
59	2,610.00	47,242.00	39,606.00	7,636.00	401.00	100,000	139,606
60	2,691.00	49,933.00	41,675.00	8,258.00	413.00	100,000	141,675

At the end of 20 Years - Total Death Proceeds - Face Amount $100,000
Policy Reserve 41,675
$141,675

Net Costs to Corporation - A. If Surrendered - $8258 or $413 per year
B. If death occurs 20th Year - $8258 for $100,000

Ronald R. McNaughton (left), newly elected president of A.I.M.E., is shown receiving the presidential gavel from Dr. Joseph L. Gillson, retiring president. Mr. McNaughton is the first Canadian member to hold the top office of A.I.M.E.

Operations, Research Scrutinized In 90th A.I.M.E. Sessions

By M. F. GOUDGE

THE American Institute of Mining, Metallurgical, and Petroleum Engineers held its 90th annual meeting in St. Louis, Mo., from February 26 to March 2, 1961, at the Chase-Park Plaza and Ambassador hotels. About 2,800 delegates were registered.

Ronald R. McNaughton, manager of the Metallurgical Division of the Consolidated Mining and Smelting Company of Canada, Ltd., Trail, B. C., succeeded Dr. J. L. Gillson as president. Mr. McNaughton is the first Canadian to head the 90-year-old institute, which has 37,000 members. Well known for his metallurgical accomplishments, he has been closely associated with the great metallurgical plant at Trail for many years and has won international distinction. He is a member of the Canadian Institute of Mining and Metallurgy, and of the British Columbia Association of Professional Engineers. Mr. McNaughton has held a number of offices in A.I.M.E., having been director of the institute, chairman of the Metals Branch, and chairman of the Extractive Metallurgy Division.

Medals and honors of the institute were presented during the meeting. Honorary membership, the highest honor within the gift of the institute, was bestowed on three men: Dr. Rene Victor Marie Perrin of Paris, noted French metallurgist; Carl E. Reistle Jr., executive vice-president, Humble Oil & Refining Company; and Dr. John Fairfield Thompson, honorary chairman, The International Nickel Company of Canada, Ltd. Currently there are only 19 honorary members of the 37,000-member organization, and at no time may the number of honorary members exceed 20.

Of particular interest to producers of industrial minerals was the presentation of the Hal Williams Hardinge Award, established in 1958 by Mrs. Hal Williams Hardinge in memory of her husband, to Raymond B. Ladoo, consulting engineer, Newton, Mass. Because of illness, Mr. Ladoo was unable to receive his award in person. A member of A.I.M.E. since 1914, Mr. Ladoo has done much to encourage interest in industrial minerals and is outstanding in his field. The citation prepared in honor of Mr. Ladoo read: "For his work as engineer and author in bringing about wider recognition of the vital part played by industrial minerals in the national economy."

Carl F. Clausen heads the Industrial Minerals Division for 1961, succeeding Ray H. Feierabend. Mr. Clausen is director of the manufacturing process department of the Portland Cement Association, Sko-

Carl F. Clausen, Portland Cement Association, Skokie, Ill., was named to head the Industrial Minerals Division for 1961.

Raymond B. Ladoo, consulting engineer, Newton, Mass., received the Hal Williams Award.

kie, Ill. He has long been associated with industrial minerals and has held many offices in the division. Leon W. Dupuy is secretary-treasurer.

The new president of the Society of Mining Engineers of A.I.M.E. is James C. Gray of Pittsburgh, who succeeded A. B. Cummins.

Some 400 papers were presented at the technical sessions. Most of those of particular interest to readers of PIT AND QUARRY were presented at the sessions of the Industrial Minerals Division. A resume of many of those papers follows.

Mineral Aggregates Dr. John Lemish, department of geology, Iowa State University, in his paper, *Research in Carbonate Aggregate Reactions in Concrete,* discussed the findings to date of the research program conducted at the university. This research showed that various types of reaction between aggregate and cement can occur in addition to the well known alkali-aggregate reaction associated with the prescence of reactive silica in the aggregate. Argillaceous dolomite used as an aggregate may cause deterioration in concrete. Early in the study it was concluded that clay in limestone might be indicative of poor performance of concrete.

Weathered aggregate, having increased absorption, was also found to be assocciated with deterioration; and the size of the pores in the rock could be important from the durability standpoint, although pore size alone is not indicative of the performance of an aggregate.

A recent finding of the research is that silica can migrate from the cement into the aggregate and *vice versa.* Also, all components of a carbonate aggregate may be affected by alkali in the cement and not the silica alone. Pure dolomite and pure calcite limestone give no trouble.

The research has pointed up more problems than it has solved, but it has shown that the cement-aggregate reaction is selective, and that argillaceous dolomitic rocks react with cement. Work is still in progress, but results will not be available for some time. Perhaps the greatest gain from the work is the awareness that many types of reaction can and will occur when an aggregate is placed in concrete.

James C. Gray, administrative vice-president, raw materials, United States Steel Corp., new president of the Society of Mining Engineers of A.I.M.E.

In *Specifications for Mineral Aggregates* by Joseph E. Gray, engineering director, National Crushed Stone Association, it was stated that specifications have a major influence on the quality of aggregates being produced and their cost. Since the largest use for aggregates is for highway construction, it is essential in locating a new source of supply that the product meet the specifications of the state highway departments concerned. Originally, most of the state highway departments developed specifications on the theory of obtaining the best aggregate economically available. This fact accounts for the wide divergence in quality requirements of aggregates in different areas for the same use. The specifications are therefore based on a compromise of research data, experiences, availability, and economics.

Joseph E. Gray, engineering director, National Crushed Stone Association, presented a paper on mineral aggregates specifications.

No numerical limitation in a specification separates good from bad. Any number could be decreased or increased a small amount without causing a noticeable change in performance. Any change in a specification can have a serious effect on producing plants; therefore, changes should be made only when all facts have been carefully weighed.

There is a definite trend toward more rigid enforcement of all requirements in specifications for aggregates. Limitations on such properties as abrasion-resistance, soundness, particle shape, screen analysis, and deleterious substances were discussed.

Industrial Waters One technical session of the Industrial Minerals Division was devoted to the important subject of industrial water. Nathaniel Wollman, chairman of the economics department, University of New Mexico, in his paper, *Our Future Water Needs,* voiced deep concern over the water situation of the future. He compared the forecast made nine years ago by the President's Materials Policy Commission, headed by William Paley, and the recent estimate drawn up by Resources for the Future, Inc.

He said that on the basis of information that was not available at the time the Paley report was prepared, it is reasonable to conclude that its projections have understated the growth in water use that may be expected in the future. The Paley estimate was that the United States would be using 350 billion gallons per day by 1975, whereas the Resources for the Future estimate is that 510 billion gallons per day will be used—a difference of 46 percent. It is still too soon to be certain which report will come closer to the mark, but the higher figure seems more nearly correct.

V. C. Williams, consulting engineer, St. Louis, in his paper *Saline Water Conversion Economics,* surveyed the various processes for the conversion of saline water to potable or industrial water. He said that any one process will probably not prove dominant in the field because of diverse conditions in different localities.

An exploding world population, increasing industrialization, and advancing standards of living have focussed attention sharply on a major problem—water supply. Heretofore the problem has not been acute, but with the better aquifers having been built on the most advantageous sites, with the better aquifiers having been tapped, and with the shortest aqueducts having been built, diffculties will increase in the future.

In the United States there is increasing concern about water supplies. Predictions are that by 1980 the daily use will be 494 billion gallons, which is nearly equal to the present dependable supply. This forecast is based on a conservatively estimated population of 230 million by 1980. The major uses are for irrigation, 36 percent; public water utilities, 6.5 percent; rural domestic, 1.5 percent; industrial, 23.3 percent; and steam-electric utilities, 32.7 percent. To ensure that the 494 billion gallons will be available, it is estimated that $219 billion will have to be spent during the next 20 years.

In his paper, *Water—Its Role in Mining and Beneficiating Iron Ore,* Orville D. Mussey, hydraulic engineer, U. S. Geological Survey, brought out the importance of water to the mining industry.

During 1956 about 2 billion gal. of water was used in mining iron ore in the United States, and 166 billion gal. in beneficiating iron ore. An increase of 65 percent is anticipated by 1980. Except for boiler feed water, the quality requirements for mining and beneficiating iron ores are not stringent, but adequate supplies must be available.

Although the current population increase is accompanied by an even more rapid rise in the use of water, because the *per capita* use is increasing, it is estimated that sufficient water will be available for the mining and beneficiating of iron ore in the United States in the foreseeable future, but this water use will be concentrated in the vicinity of the iron mines.

Fillers, Fibers, Pigments

When a new mineral filler is being developed, problems arise in determining the size and character of markets available for it, particularly if it is a specialty filler, said Harry W. Barr Jr., of Battelle Memorial Institute, in a paper entitled *Problems in Gauging Markets for Specialty Fillers.* The five major problems are: (1) describing the filler so that the prospective customer recognizes its possible applications; (2) finding a prospective customer who can verify the filler's applicability; (3) expanding successful test results to industrial uses; (4) appraising competitive products; and (5) discovering all the possible uses for the new filler.

A specialty filler is defined as one that modifies a specific physical property of a formulation—such as its viscosity, its reflectance, or its reaction to extreme heat. Frequently, only a small amount is required to effect the desired changes. The specialty fillers include any natural or synthetic mineral filler material that sells for 5 cents (or more) per pound.

The answers to the problems listed above are found largely through market research; and a technically oriented market research function appears to be the best means of keeping abreast of new developments and of guiding the search for new products or new markets.

In *Use of Mineral Fibers as Filter Media in Air, Gas, and Liquid Filtration,* a paper by R. K. Jones and T. M. Jackson Jr., Johns-Manville Products Corp., the properties of mineral fibers that make them suitable for specific applications were discussed.

The use of mineral fibers as filter aids or as filter septa has become widespread in the last decade. Asbestos, either alone or blended with diatomite or cellulose for special purposes, has become particularly useful wherever a high degree of liquid clarification is required.

Glass fiber, usually used alone, has found its greatest use in liquid filtration in the clarification and dehydration of jet fuels. Very fine glass fibers are used in forming filter septa for ultra-efficient air and gas filters.

L. R. Blair, Johns-Manville Inc., in his paper, *Synthesis of Inorganic Silicate Fillers and Filter Aids,* describes the making and use of synthetic hydrated calcium silicates and hydrated magnesium silicates.

Within the last 10 years much has been done in the field of calcium silicate hydrate chemistry, and it is now possible to make at least 25 different forms synethetically, some of which were available only in small quantities as naturally occurring minerals. They are produced for use as fillers, pesticide carriers, low-temperature insulating materials, and adsorbents for removal of fatty acids from various solutions.

Hydrated magnesium silicates have not been studied as extensively as the calcium compounds, but they also can be produced synthetically. Their first important use was in filtration of dry-cleaning solutions for removal of fatty acids. With the introduction of detergents, these products lost their advantage because of their high affinity for the detergent chemicals. However, in recent years increasing uses have been found for them as decolorizing agents for fats and as anticaking agents for resins; and some with very high surface area are being used as adsorbents.

Hydrous calcium compounds, many of which have their counterparts in naturally occurring minerals such as wollastonite and tobermorite, are made by reacting mixtures of calcium oxide (lime) and silica at various temperatures. In Nature most of the minerals are very rare and they can be made available commercially only by synthesis. Where the mineral is available in quantity from natural deposits (*e.g.,* wollastonite), it is not usually commercially feasible to produce it synthetically.

Synthetic serpentine and synthetic talc can be easily produced, but synthetic asbestos of commercial quality has not yet been made. The synthetic hydrous magnesium silicates that have commercial application have high surface area

and are excellent adsorbents. They are low-temperature products.

Transport Economies A joint session of the Industrial Minerals Division and the Council of Economics was held on the subject of transportation of bulky minerals. Six papers were presented at this session. In his paper, *Transportation Economics of Mineral Commodities,* W. A. Riggs, Gulf, Mobile and Ohio Railroad Company, pointed out that transportation is the greatest single cost item in the mining, processing, and marketing of solid mineral commodities. The annual volume of mineral output — about 1¾ billion tons — is transported at a cost of $5 billion.

Railways provide one-third of this transportation, and the remainder is provided by trucks pipelines and water carriers. Generally, it seems to mineral producers that their transportation costs are high, compared with the dollar value of their product. However, when the tremendous volume of ton-miles of transportation is considered, the matter appears in a different light. Typical examples of transporting various mineral products were given on a ton-mile basis.

Amil Dubnie of the Canadian Department of Mines and Technical Surveys, in a study entitled *Transportation of Minerals in Northern Canada,* pointed out that the area of northern Canada, *i.e.,* north of 55 degrees N. latitude, is more than one-half that of the entire country. The mineral production of this area amounts to about 6 percent of the Canadian total. Means of transport available are inland and coastal shipping, highways, railways, pipelines, and aircraft, the latter being the only *adequate* means of transport over most of the vast area.

Cost of transportation is the greatest single deterrent to the development of the mineral resources of this area. Based on existing charges, the costs of moving minerals by the various means of transportation are as follows: rail, 0.83 to 9.1 cents per ton-mile; inland water, 6 to 12 cents; northern coastal water, 0.8 to 2.5 cents; road, 5 to 25 cents; air (noncharter), 40 cents and up. Details of costs in various parts of the area were given.

Thomas B. Douglas, vice-president, Ideal Cement Company, described this firm's long transport conveyor belt at Ada, Okla.

Mr. Dubnie stated that existing transport facilities demonstrate the superiority of railways as the backbone of an economical transportation system. As sufficiently large mineral deposits are developed in northern Canada, the construction of major railways will be justified. Other forms of transportation can effectively complement the railroad in meeting the problem of transportation—the principal challenge to northern development.

N. Gritzuk, manager of the transport divisions of United Veno Hill Mines and Cassiar Asbestos Corporation, also dealt with transportation in the north in his paper on *Long Haul Transportation of Minerals in Canada's Far Northwest.* Asbestos fiber from Cassiar, B. C., and silver-lead-zinc concentrates from United Veno Hill Mines in Yukon travel by highway, narrowguage railway, and water (combined) in going from the mines to Vancouver. The distances are 1,357 miles for the asbestos and 1,287 miles for the concentrates.

Packaging of the concentrates in 2-ton containers and the asbestos fiber in 100-lb. jute bags compressed to a density of 57 cu. ft. to the ton are important to the economy of shipment. Another economy factor is the special design of the semi-trailer vans. Each of these units can carry 22 tons of asbestos from the mine and return to the mine from the railroad with 2,000 gallons of diesel fuel.

Transport represents about 33 percent of the cost of production. Highway costs are 5½ cents per ton-mile for diesel-powered, semi-trailer units that can be loaded to 95,000 lb. gross. Mr. Gritzuk believes that costs could be lowered to 3½ cents per ton-mile if rubber-tired trains carrying loads up to 200,000 lb. were used.

In his paper entitled *Water Transportation of Fertilizer Ingredients: Opportunity and Challenge,* Odin Wilhelmy Jr., Battelle Memorial Institute, expressed the opinion that opportunities not yet fully realized exist in increasing the transportation of fertilized ingredients by water. He referred particularly to the shipment of Florida phosphate from Tampa to points along the coast of the Gulf of Mexico and to New Orleans for trans-shipment by barge on inland waterways into the heart of the continent. He stated that before the benefits of the increased water movement can be realized, however, storage and grinding facilities will have to be established at strategic points; and more economical methods of handling are needed.

The operation of the world's longest cross-country belt-conveyor was desribed by Thomas B. Douglas, vice-president, Ideal Cement Company, in his paper, *Economics of 5½-mile Transport Conveyor Belt at Ideal Cement Company's Ada, Okla., Plant.* In operation since August, 1959, transporting crushed limestone and shale, the belt has a capacity of 1,000 t.p.h. Actual costs for 1960 were 13.3 cents per ton of material carried, which is well below the estimates for either rail or truck haulage.

The belt is 36 in. wide, 28,553 ft. in length over all, and is made up of seven flights, the longest of which is 11,766 ft., or 2.23 miles. It is operated at a speed of about 500 f.p.m. Total connected horsepower is 1,050. The supporting structure consists of precast con-

(*Continued on page* 179)

Employee Benefits

(*Concluded from page 87*)

purposes of the compensation agreement. In providing reserves to take care of the liabilities in the event of death and retirement, funding costs can be kept at the minimum by recognizing the ultimate tax recoveries which will be made with the proceeds being paid out in accordance with the provisions of the deferred compensation plan.

Tax Advantages to Both Employer and Employee Tax advantages accrue both to the employer and employee. There are three major benefits.

1. These deferred benefits, when paid by the employer to either the employee or his family, would be deductible as a business expense for income tax purposes.

2. Prior to retirement, no income tax liability will accrue to the key employee.

3. The first $5,000 of any death benefit paid to the family would be income tax free.

An illustration of a deferred compensation plan is as follows:

(A) Problem: R.M.C. Corporation wanted to retain the services of its chief executive for consultation advice after his retirement. An agreement was made whereby he was to receive his full salary prior to retirement and a lesser amount for life upon retirement. Should he die within 10 years after retirement, his retirement income would be paid to his widow for the balance of a 10-year period. The corporation wanted to fund this future obligation during the period when the executive's services were of greatest value.

Solution: A special insurance contract was arranged which would be fully paid prior to his retirement. The insurance contract would be owned by the company, and payments under its terms would go to the company for the purpose of carrying out its obligations under the compensation agreement. In addition to providing the necessary cash to cover all phases of this agreement, substantial tax advantages accrued to both the executive and the corporation.

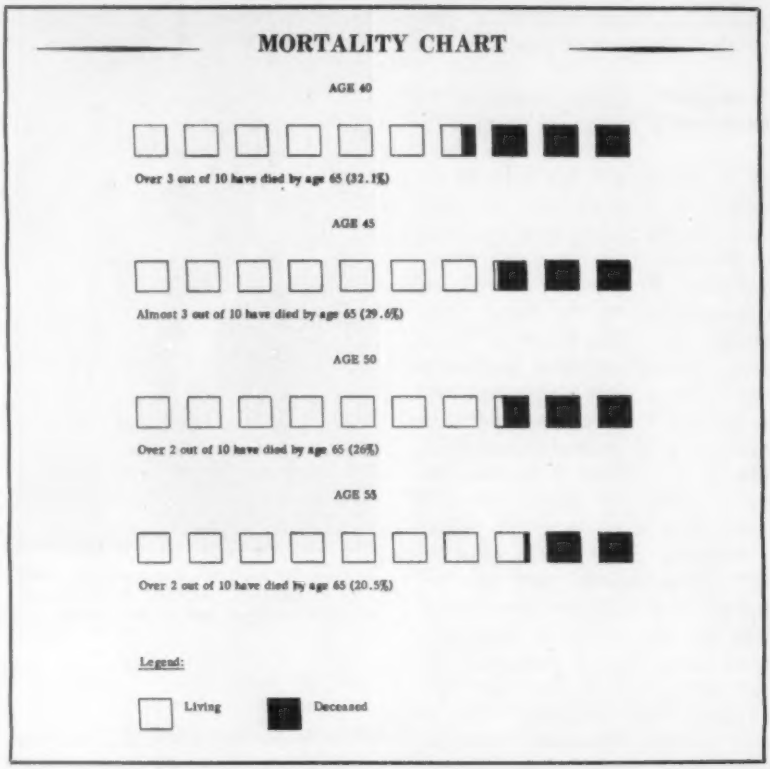
(B) Problem: A younger executive in the same corporation who was being groomed to succeed the chief executive upon the latter's retirement had received an attractive offer from a competing firm. Since his present compensation was such that a large salary increase would have netted him very little after taxes, the corporation wished to offer him a more attractive proposal to remain.

Solution: It was suggested that an employment contract be drawn up to provide substantial benefits for the executive's family in the event of his death, plus substantial retirement benefits. The vehicle selected for the corporation to meet its obligations under the agreement was a policy similar to the one obtained for its chief executive. This "deferred" compensation, with its resultant tax advantages and family protection, plus retirement benefits, succeeded in retaining the services of the future chief executive.

An illustration of the effective use of life insurance in funding both the stock retirement and the deferred compensation plans may be obtained from studying the accompanying cost chart. The corporation is provided with $100,000 of insurance protection at an average cost of $413 per year, when spread over a 20-year period. This, in effect, means that the net cost providing the insurance protection is less than 0.5 percent per year. (See chart on page 87.)

The value of insuring key employees is clearly illustrated when we realize that modern mortality tables show that a relatively high percentage of men, at any age, will survive to age 65 and beyond. To illustrate, we have applied the percentage of 10 men of various ages. The smaller the group, the greater the risk assumed by the person or firm financially concerned with the survival of a key employee. (See mortality chart above.)

Producers interested in setting up stock retirement or deferred compensation plans for their companies may want to consider utilizing the services of a professional consulting firm familiar with the needs of the industry, such as Donald Shepherd and Company, Inc.


MORTALITY CHART
AGE 40
Over 3 out of 10 have died by age 65 (32.1%)
AGE 45
Almost 3 out of 10 have died by age 65 (29.6%)
AGE 50
Over 2 out of 10 have died by age 65 (26%)
AGE 55
Over 2 out of 10 have died by age 65 (20.5%)
Legend:
Living
Deceased

National Gypsum climaxed a year-long construction program with a ceremony marking completion of an addition to its Buffalo headquarters.

pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

24th ANNUAL LIME and AGSTONE SECTION

may 1961

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A-C engineers are constantly working to improve products and processes. The *Grate-Kiln* system is one result of their efforts. Others include: larger, more efficient screens; fuel-saving coolers; automated crusher systems. How can these developments help you? *See your A-C representative, or write* **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wis.*

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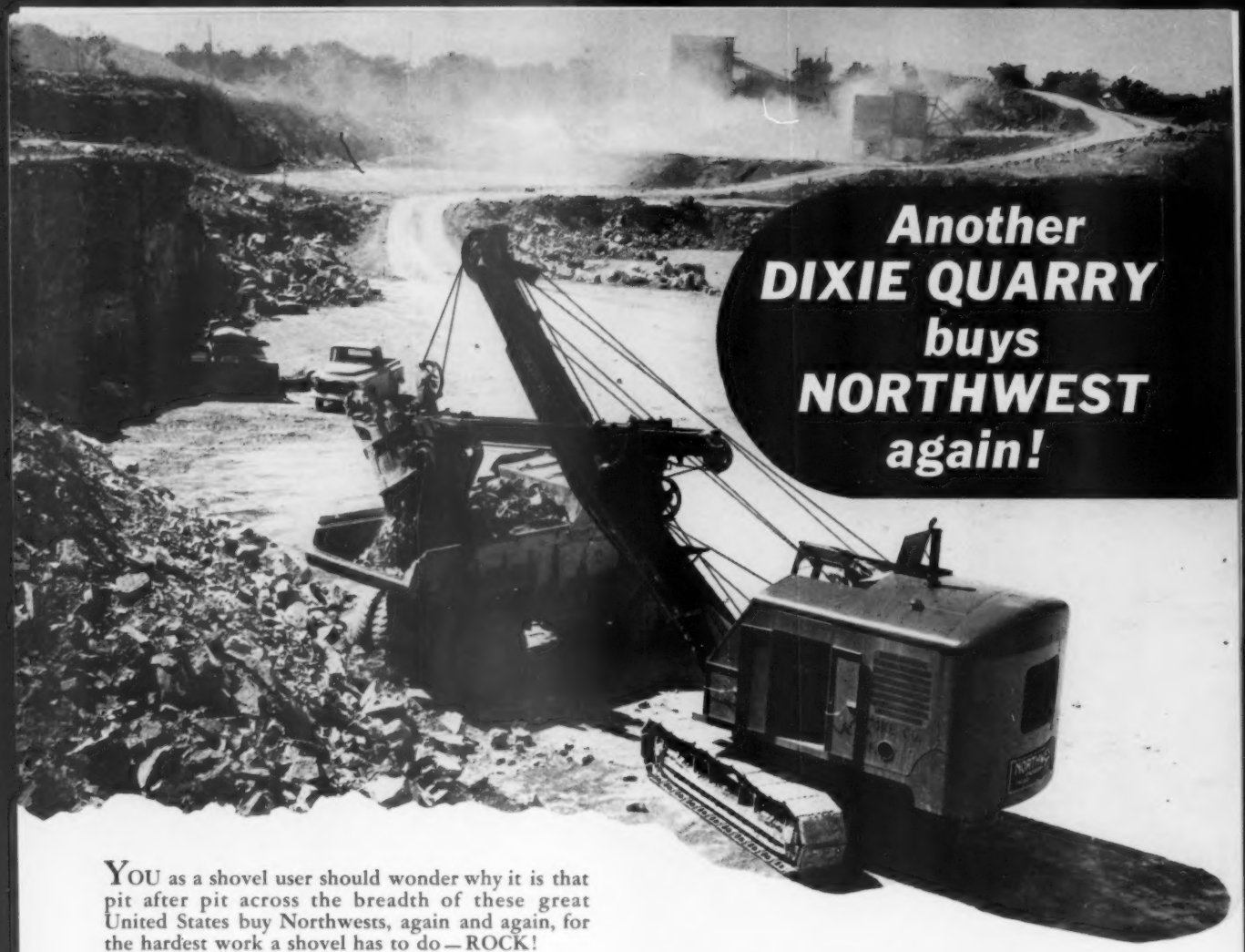
Jaw Crushers

Gyratory Crushers

Grinding Mills

Kilns, Coolers, Dryers

Enter 93 on card, page 217



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NORTHWEST

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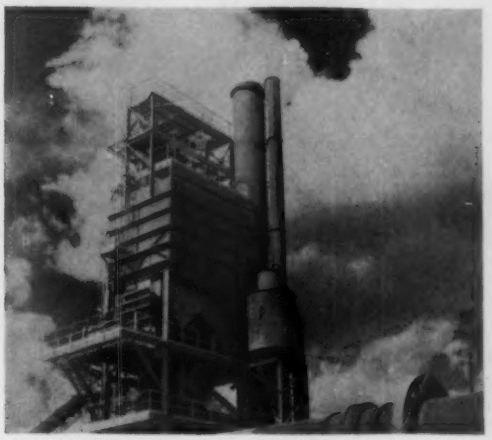
PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	25-Ton and 45-Ton Capacity

3/4 to 3
Cubic Yard Capacity

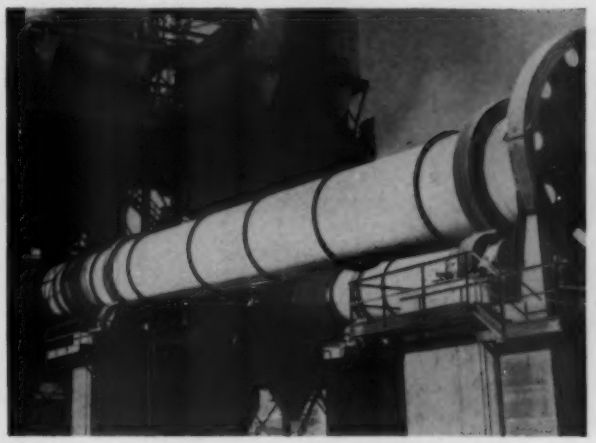
KENNEDY lime plant equipment

KENNEDY Stone Preheater



Puts kiln exit gases to work to partially calcine feed. The KENNEDY Stone Preheater makes the rotary kiln the most economical producer of high quality lime.

KENNEDY Short Rotary Kiln



KENNEDY heat-saving auxiliaries make long kilns unnecessary. There is less kiln to buy and maintain; there is less brick — fewer foundations; alignment is simpler.

KENNEDY Centralized Kiln Control

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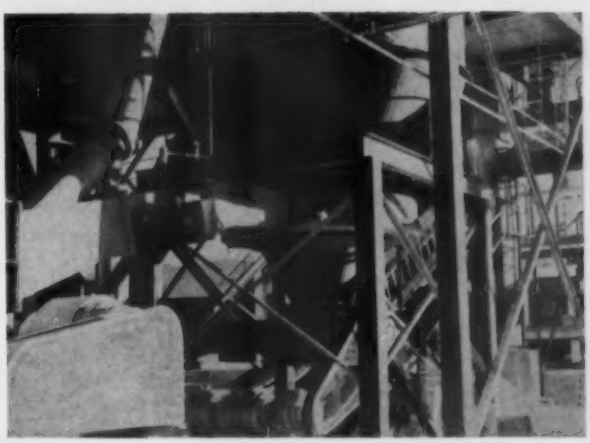

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"Our 2½ and 3 yard P&H shovels are real 'rock movers.' Magnetorque swings are faster and smoother than anything I've seen in the industry. Our schedule requires rock and lots of it—that's why we use our P&H shovels for this operation."

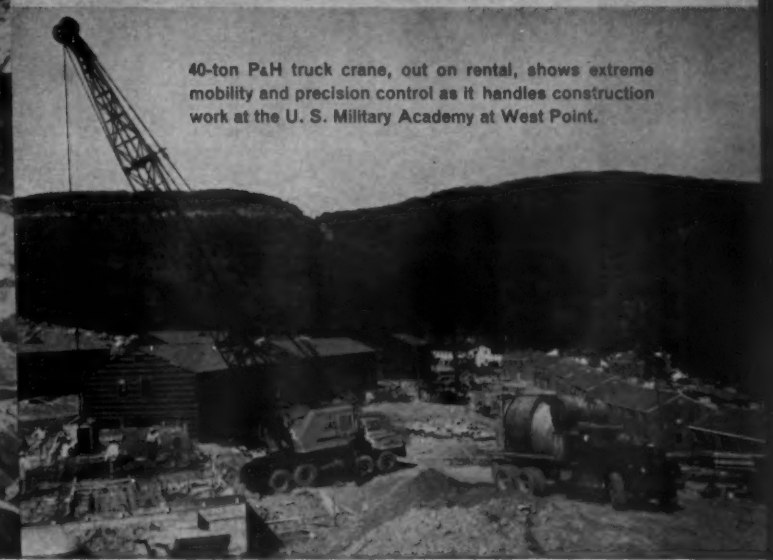
2 P&H shovels keep production in high gear

Oscar Dufour, Quarry Superintendent, uses his two P&H rigs to handle all rock excavation for the Riverdale Stone Quarry operation. These two rigs maintain a 20-second work cycle. Magnetorque Drive makes the cycles faster and smoother, permits more accurate loading of the trucks. His operators can work all day without tiring, so he gets more yardage per day.

P&H rigs give more efficient, trouble-free operation

Art Whitesell, operator of the 3-yard P&H, has this to say—"It has plenty of power for rock work . . . and compared to friction clutches that heat up

For the digging motions, P&H Planetary Chain Crowd and Retract gives more positive crowding action in the bank and a faster retract.



40-ton P&H truck crane, out on rental, shows extreme mobility and precision control as it handles construction work at the U. S. Military Academy at West Point.

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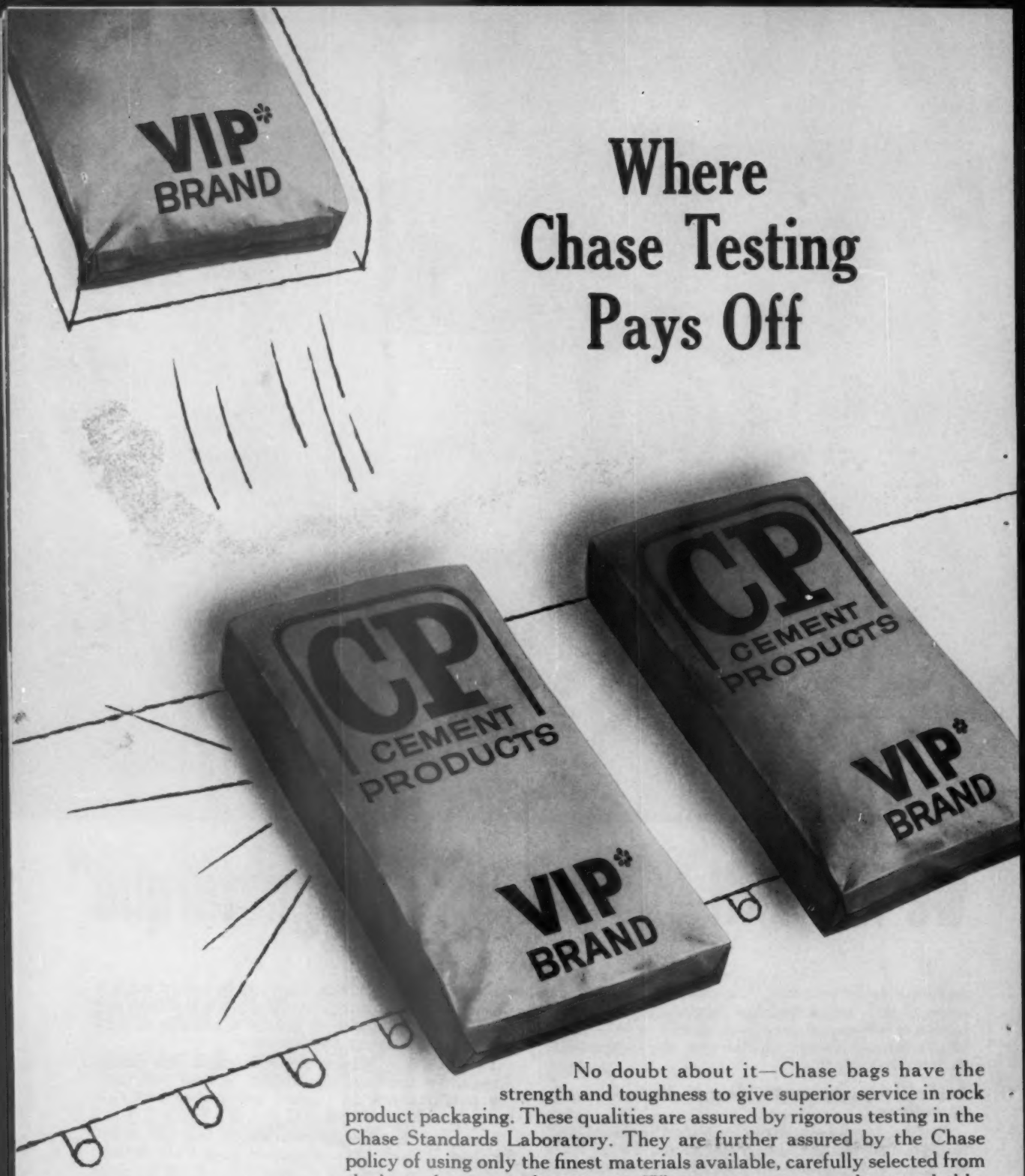

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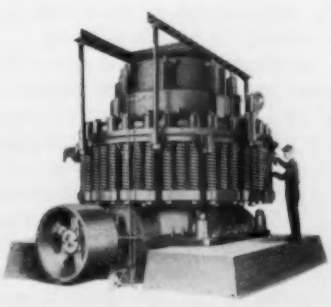

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Quality goals met with specialized agstone plant

• Products, capacity, service benefit from careful planning

By BUREN C. HEROD

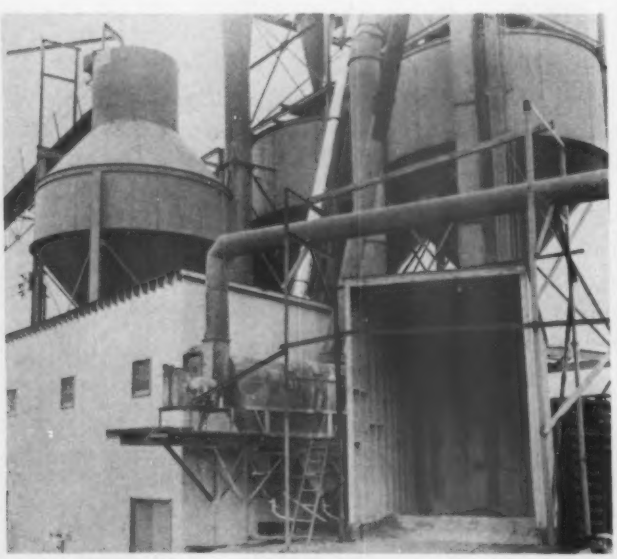
WITH the recent installation of highly specialized facilities for production of agricultural limestone products, Rockydale Quarries Corporation, Roanoke, Va., solidified its position as one of the leading suppliers of these materials in the marketing area. Further, the planning and design of the new operations mirror the philosphy of Rockydale management, among other progressive producers, that agricultural materials are premium products—and as such merit careful attention in setting up processing systems for their production.

Until 1953, Rockydale, like many agstone suppliers, had not made agstone as a specific commodity among the other materials produced; it was a by-product. However, the growing needs of agriculture in the area indicated that this market could be best met if special equipment were installed. That step would assure not only greater capacity in agriculture limestone products, but also that they would be of higher quality.

Accordingly, a battery of three crushing and pulverizing units, plus screening and classifying equipment, were installed in the Rockydale plant at Roanoke. This stepped up the production rate to 30 t.p.h. in all agricultural materials. Some additional benefits were also immediately realized. Among these was the ability to make stone sand and granular fertilizer filler, both in considerable demand.

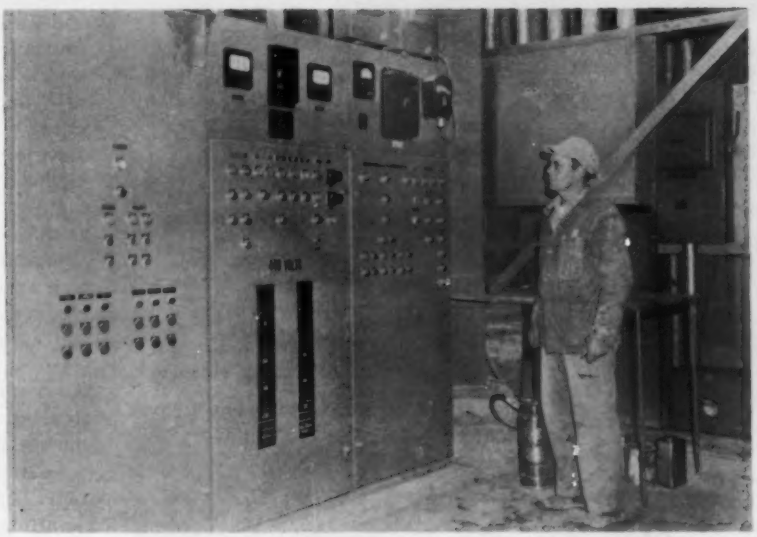
By 1959 it was evident that the potential in a larger marketing area would justify further expansion of agstone production. This indication led to the construction of the firm's newest facility—a specialized plant at Starkey, about two miles from the main operation, which went into production in March, last year.

In planning for a new mill at that point, management took advantage of two highly significant factors—(1) the Starkey site permits shipping by rail into a larger area than could be served by truck from Roanoke; and (2) improvements based on lessons learned in the Roanoke mill could be incorporated in the design of the new. The older plant services primarily the local area, entirely by truck and with only bulk material.



Prior to passing to atmosphere, exhaust gases from the milling system are passed through the wet scrubber (left center). To the right of the scrubber are the dump hopper and bucket elevator with which materials trucked over from the Roanoke plant can be rehandled and placed in the rail-loading system.

The new specialized operation at Starkey represents not only gains in productive capacity and quality of agricultural limestone products, but realization of greater distribution and marketing potential. At the right in this over-all view is the feed conveyor delivering stone to the mill feed bin (lower bin at center); the finished product bins and loading points (left); and the bagging installation, in the structure at the right.



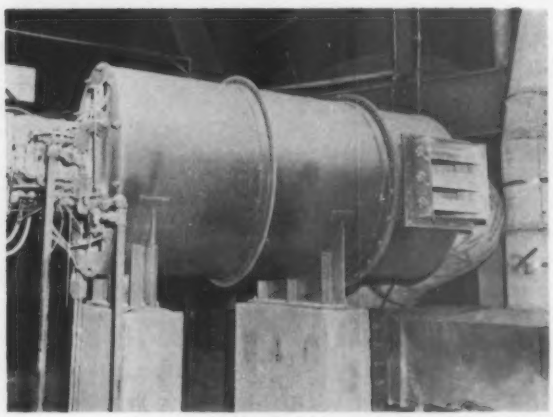
Above: Automation in the new plant covers the entire process, from feed bin to loading. The centralized controls and instruments are housed on this panel in the mill building.

Left: Feed for the Starkey operation consists of clean 1-in. stone trucked over the short haul from the Rockydale quarry at Roanoke. A control is provided for the drivers at the dump hopper, permitting them to operate the feed conveyor to run the hopper empty.

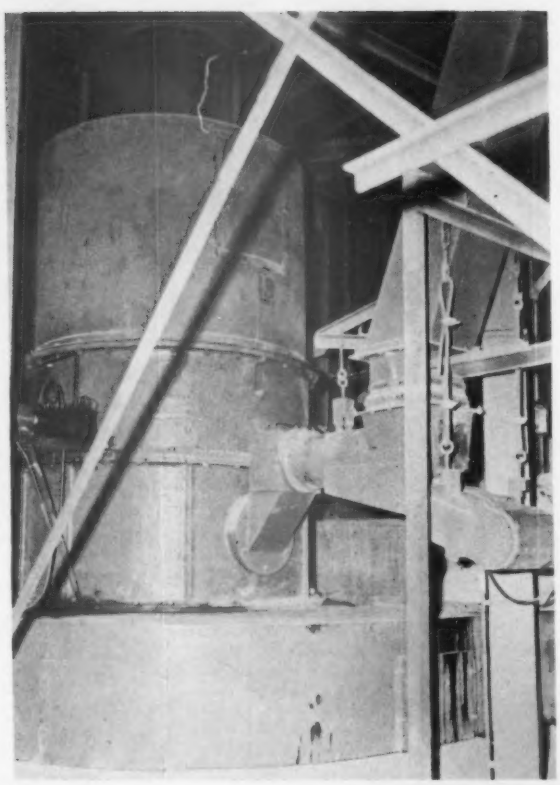
At Starkey both rail and truck shipments are accommodated with bulk and bagged products. Further, the facilities can be used to handle certain material trucked over from the Roanoke plant for rail loading.

Based on specifications of Rockydale officials, the new Starkey mill operation was designed by Bradley Pulverizer Company engineers. Southern Machinery Company cooperated in the project on the various material-handling systems. At the heart of the operation is a Bradley Pneumatic Hercules mill, Type 10, with its related air, feed, and classifying equipment. In conjunction are a battery of finished product bins and distribution lines supplying rail and truck loading points and the adjoining bagging installation.

Every phase is automated, with the exception of the bagging operation; and plans have been made to make appropriate changes to that setup in the future. Each stage of the over-all flow is controlled from a central panel in the mill building. This refined processing flow was developed from experience in the Rockydale mill, which, although productive, is a "manual" operation with individual control points for the various units involved.



Hot air for flash drying in the mill is provided by this oil-fired furnace; part of the mill top can be seen in the right background.



A close-up of the 250-hp. pneumatic mill. Leading down from upper right is the chute from the mill feed bin. The vibrating feeder at the bottom of the chute transfers the stone at controlled rates to the mill.

Both mills are supplied with raw material from the Roanoke quarrying operations. The stone is from the Shady dolomite, which normally averages about 55 percent $CaCO_3$ and 45 percent $MgCO_3$. The company guarantees its customers a CaO equivalent of 100 percent.

The older agstone mill at Roanoke is fed 1½-in. stone from the aggregates plant, this material being brought from the plant by conveyor and discharged into a feed hopper. Processing components in this flow include a pair of Tornado crushers (3-ft. and 5-ft.), a Bradley Hercules screen mill, Type 6000, a Sturtevant separator, screens, and related conveying units.

In the process, 6-mesh by 20-mesh, and minus 20-mesh material is produced, the latter two representing such specific agricultural limestone products as granular fertilizer filler and agstone *per se*. To offset any seasonal variation in agstone demand, production of the 6-mesh material, or stone sand, is stepped up, and the finest fraction is stockpiled as "damp" agstone. In normal demand periods, the agstone is placed as produced in a 500-ton storage bin from which it is directly loaded into trucks as "dry" material. Overall production capacity is about 30 t.p.h.

Feed for the new Starkey operation consists of clean 1-in. stone which is trucked for a short 2-mile haul from the quarry at Roanoke. A push-button control is provided at the feed hopper of the Starkey plant; and when a truck load has been dumped, the driver starts the 24-in. Marco plant feed conveyor and lets it run until the hopper is empty.

The feed belt discharges into a 190-ton capacity Heltzel bin, from which the 250-hp. Bradley mill is supplied. Stone is transferred from the bin to the mill *via* Syntron vibrating feeder in initiating the flow.

Air for the pneumatic system is provided by a 150-hp. Bradley type blower manufactured by LeHigh

Both rail and truck shipments of bulk and bagged products can be originated at the new plant, and the location on the mainline of a rail system permits serving a considerably larger area than formerly. The screw conveyor system seen here below the product bins recovers and transfers material to the rail- and truck-loading spouts, and to the hopper (at side of building) that supplies the bagger.

Below: To meet specifications of both states in which it is marketed, bagged agstone produced by Rockydale must have 70 percent passing 100-mesh (of the bulk material, 50 percent must pass 100-mesh). Shown here is the three-spout bagger.

Fan & Blower Co. A Todd-Thermo oil-fired furnace delivers hot drying air at about 675 deg, F. into the duct from the blower to the mill. The air stream from the mill, carrying the finished product, rises through the grinding chamber and fineness selector to a pair of cyclones from which the finished product is discharged through rotary valves into a distributing screw conveyor. A return air duct from the cyclones to the blower closes the pneumatic system. Exhaust from a vent duct is delivered to an Air Tumbler wet scrubber to remove dust before the vent air passes to atmosphere.

The distributing screw below the cyclones feeds a group of three 22-ft. diameter conical-bottom Heltzel bins. This same screw also receives the discharge of a bucket elevator which handles granular fertilizer filler from a separate dump hopper when that material is trucked over from Roanoke for rail loading.

Below the bins is a collecting screw with which the products are transferred to rail- and truck-loading screws and chutes. A Swivel-loader is also provided to handle bulk-loading of boxcars.

From one of the bins, a screw conveyor carries material to the feed hopper of a 3-spout Black Products bagger in the packhouse. Only the one bin is used for this supply, although it may also be drawn upon for bulk loading. All rail shipments from Starkey are originated on the Norfolk and Western mainline and consigned primarily to southern points in Virginia and North Carolina. With two loading trucks available, bulk and bagged loading can be carried out simultaneously.

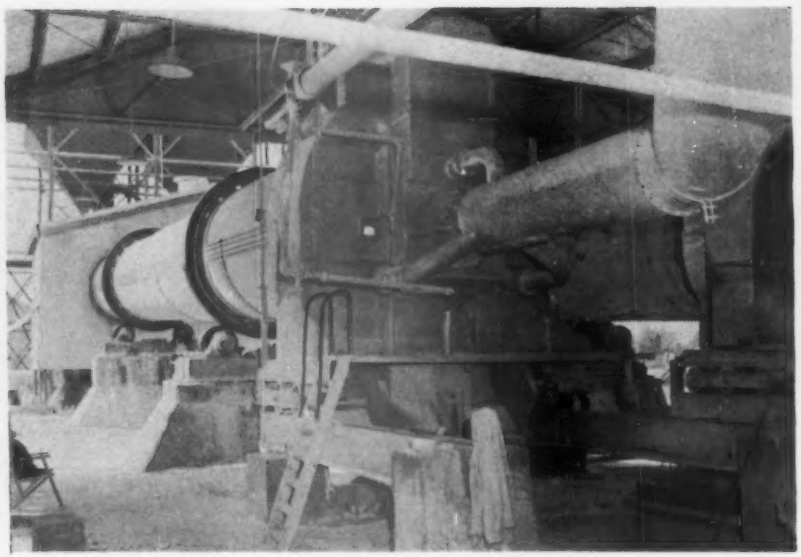
Over-all capacity at Starkey is about 23 t.p.h., and the loading setup will handle three cars per shift with granular material. In two shifts, 10 cars of bagged products can be loaded.

Instrumentation and centralized controls for the entire Starkey operation are installed on a Bradley central control panel supplied by Emtrol, Inc. These include mill and blower motor ammeters; air temperature recorders; and controls for the mill feeder, mill, blower, heater and heater oil pump, air system dampers (both automatic and manual), rotary valves under the cyclones, sliding gates under the bins, and screw conveyors.

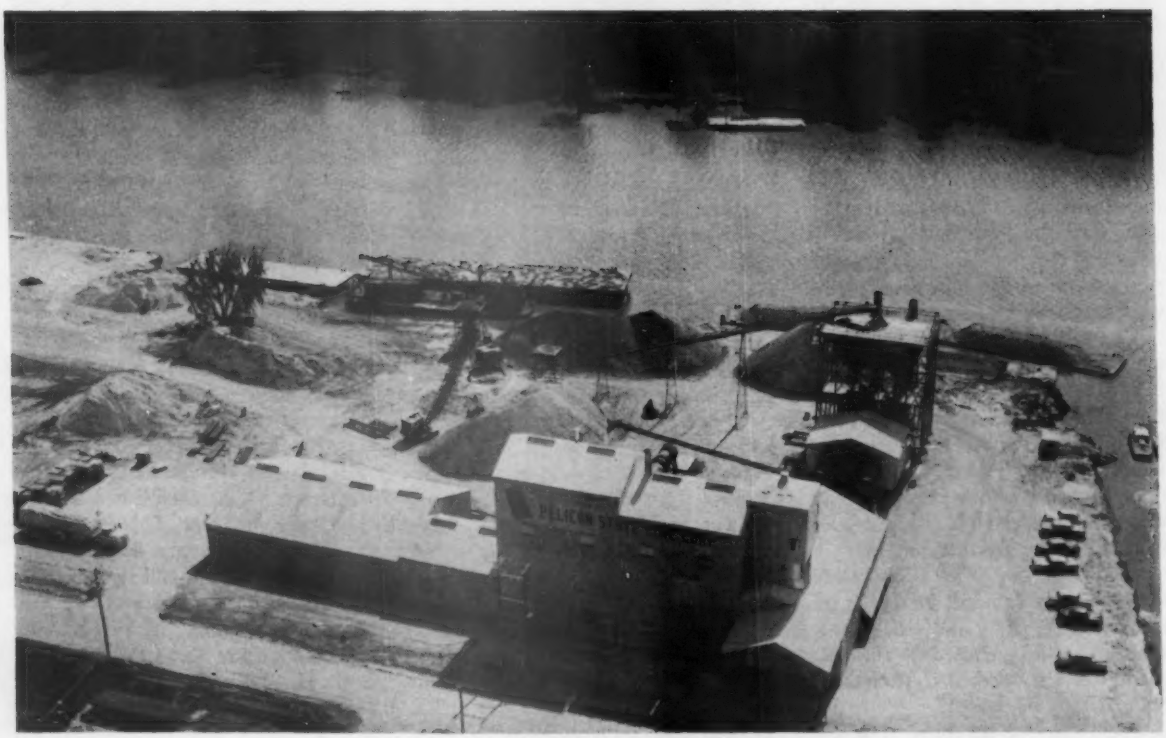
With this highly efficient installation, the company has no difficulty in meeting the two sets of specifications involved in its marketing area. The specifications are the same for both Virgina and North Carolina, but they call for two ranges of fineness. With respect to bulk agstone, 100 percent must pass a 20-mesh screen, and 50 percent must pass 100 mesh. Of the bagged product, 100 percent must again pass 20 mesh, but 70 percent must be finer than 100 mesh. The latter specification does not affect material made in the original mill at Rockydale since shipments from that point are entirely in bulk.

Operations at Starkey and Roanoke are under the direction of Eugene Puckett, general superintendent. In addition to providing facilities for specialized production of agricultural limestone products, management has established a full-time sales program. This is the responsibility of Henry Scholz, who makes regular sales and service calls throughout the area served by the company. Heading the progressive organization are Keith Willis, president; H. Willis Jr., vice-president; and Gordon Willis, secretary-treasurer.

New Louisiana



One of the two 7- by 120-ft. rotary kilns, with its special type of gas burner. The cross screw conveyor is below.



Plant Produces Lime from Oyster Shell

By WALTER E. TRAUFFER

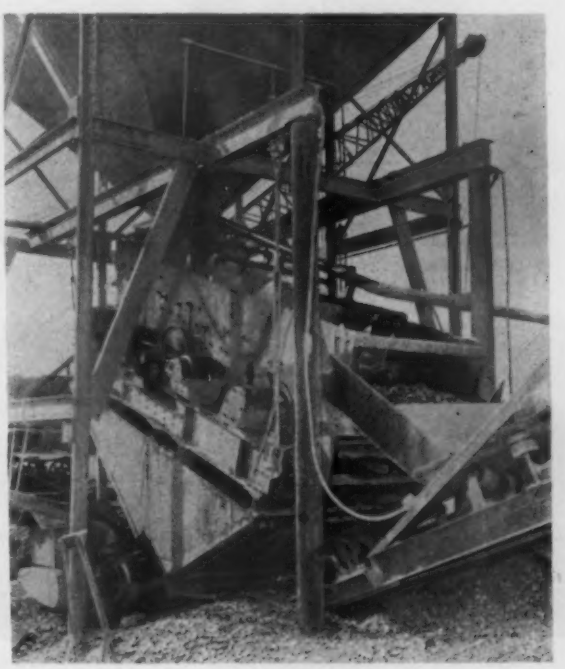
THE production of lime in Louisiana, which has been rather spotty over the years, got a big boost when, in February, 1959, the Pelican State Lime Corporation put in operation its new $1,500,000 rotary kiln plant near Morgan City, La. Located on the Intercoastal Canal 5 miles east of that city, on Bayou Boeuf, this 200-ton-per-day operation is well located to receive shell raw materials by water, and to ship its products by truck, rail, or water. Sales are being made for water treatment, to chemical plants, paper mills, sugar refineries, etc. A growing amount is also being sold for oil well drilling and soil stabilization.

Recently a $500,000 expansion was undertaken which will shortly result in even more diversification of markets. When the project is completed, the company will have added mineral filler, high-calcium shell chips for poultry, and agricultural liming materials to its product line.

The new plant was the result of a search by its owners for a sound business venture. Anthony Guarisco, president of this company, started as an automobile dealer in Morgan City, and he still has a major interest in this business. He is also part owner of a large shopping center in Morgan City. In 1949 he, with his brother John, went into the shell business, as the Guarisco Construction Co., Inc., dredging the shell from a lake in the area. This venture developed until three dredges, 10 towboats and 50 barges were being operated.

The availability of this shell made the lime business seem attractive; and after an extensive statewide survey, it was decided to build at the construction company's dock and yard. Construction of this plant was begun in February, 1959. After it went into operation in December, 1959, the shell dredging and sales operation were sold to the Lake Charles Towing & Dredging Company, Lafayette, La., and the Bay Towing and Dredging Company of Mobile, Ala.

For a time the raw material consisted of both clam and oyster shells, the former being barged over 100 miles *via* the Intercoastal Canal from Lake Pontchartrain. The long haul made the clam shells very expensive, and their use was discontinued. Because of their roughness and irregular shape, the oyster shells also roll better in the kilns and are more economical to calcine. The reef oyster shell now used comes from a bay 20 miles toward the



The vibrating screen, with sprays, which now washes the shell before it is fed to the plant.

Opposite page: This aerial view of plant of Pelican State Lime Corporation shows its location on the Intercoastal Canal. Oyster shell raw material is received in barges, and much of the output is similarly shipped.

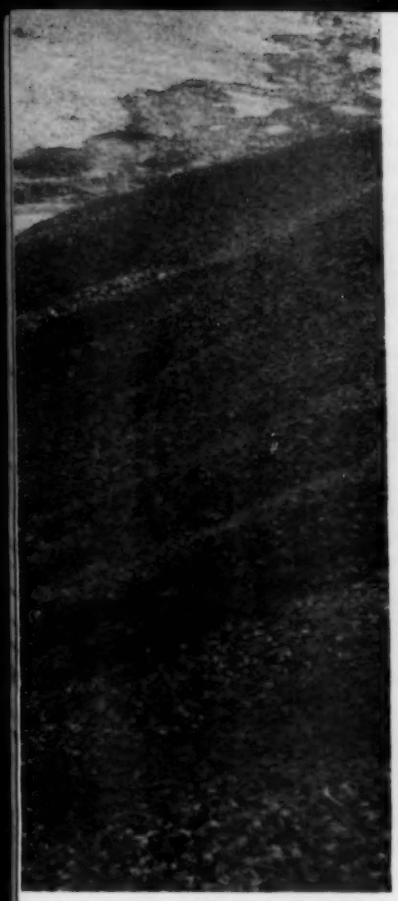
Here's typical fast Michigan Model 275A loading: two passes of 4½ yd bucket, 40 seconds heap 10 ton truck.

Model 275A bucket-loads average 4.50 yards, 5.85 tons each, per scale-measurement.

Frequent Michigan odd-job: cleanup after blasting. Unit works much faster than crawler-dozer, has added advantage of being able to bucket-lift rock higher than can blade.

Michigans move fast around the quarry, average 18 mph, often hit top of 28 mph.

Here's an unusual but profitable market for LaGace: ⅛" stone for ice control. Last year, the company sold over 25,000 tons to airports and highway commissions. Like most limestones, this material contains small percentage of salt. Thus it has advantage of sticking to ice and not rolling off like sand. The result: better traction for airplanes and cars. Some of the material is stored under cover and sold dry; other customers prefer to buy from this open stockpile. The LaGace firm also makes substantial sales to the concrete industry (mostly ¾" to 1½" unwashed stone) . . . asphalt producers (200 mesh) . . . roofers (⅛") . . . paving contractors (½" to 4") . . . and fertilizer plants (5 mesh).



There are, in Quebec, 27 major stone quarries. Almost all of them, 25 to be exact, do their stockpile loading with Michigan Tractor Shovels

The amazing record of one machine at one pit:

416 TRUCKS LOADED IN 8 HOURS!

Production like this certainly *helps* explain the popularity of Michigan Tractor Shovels.

But there are other reasons for this popularity—reasons which *might be of great importance in YOUR profit picture.* As a case in point, let's take ownership in Quebec, Canada.

In Quebec, over 90% of all the major rock quarries use Michigan Tractor Shovels for stockpile loading! This overwhelming preference, this record of buying and rebuying at this location, we feel, is particularly significant. For in Quebec, machines are tested by terrific extremes of *working* temperatures—40° *below* to 110° above. Tonnage demands are increasing rapidly. Distances are great and job sites are often hundreds of miles from repair and maintenance facilities.

Repeat buyer likes Michigan dependability, dealer service

One typical Quebec owner—LaGace Quarries Ltd, Montreal—exemplifies the reasons for Michigan popularity under these conditions. "Michigans usually load faster than other Tractor Shovels," says Paul LaGace. "Hence they produce more. Michigans cause less trouble, mechanically speaking. And when something does go wrong, we get excellent service from our Michigan Distributor (Blackwood-Hodge Ltd) and from Clark Equipment Company."

The LaGace firm reports from long experience. They bought one of the first Michigan Tractor Shovels sold in Canada—a 1¼ yd Model 75A—in 1954. Today, they own six Michigans: the original Model 75A, two Model 175A's equipped with 2¼ yd buckets, and three Model 275A's with 4½ yd buckets.

20 seconds per bucket load

Loading with *any* of these units from *any* of 22 crushed stone stockpiles—4" and run of crusher to lime dust—takes an average of only 20 to 25 seconds per pass, according to company time-study averages. Thus, a skilled operator and a 4½ yd Model 275A regularly heap a 25 ton hauler in five passes, under 2 minutes. A 12 ton tandem-axle truck takes a 275A two passes, 40 to 50 seconds. Top daily load count, so far, for a Model 275A has been an amazing 416 trucks, 10 to 15 tons each, in 8 hours! Production, overall, with the six Michigans loading at LaGace's two pits, has averaged 1,000 to 2,000 tons hourly—over three times as much as before Michigans.

Other jobs: loading shot rock, cleanup after blasting, etc.

The Michigans do a lot of odd jobs too. In emergencies, they have loaded quarry rock. Several of the units often handle cleanup after blasting, dozing and lifting material into high, centrally-located shovel-efficient piles. At times, they clean spillage from haul roads and crusher sites. They tow stalled vehicles. In winter, they plow snow. As Raoul Savage, quarry supt, puts it, "*Whenever we want to lift or haul anything, we just call for one of the Michigans.*"

Good advice! If you *don't have* a Michigan—or if you'd like to see the performance advantages of our *latest models*—call your Michigan Distributor for a demonstration.

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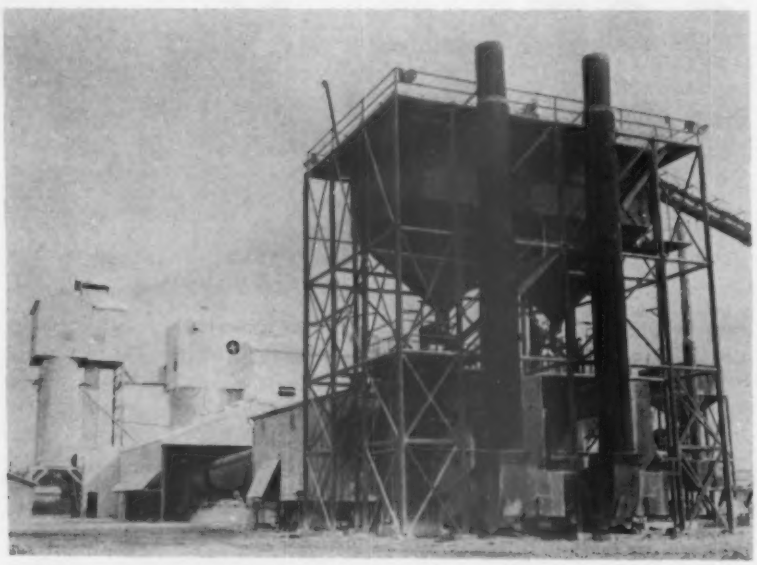
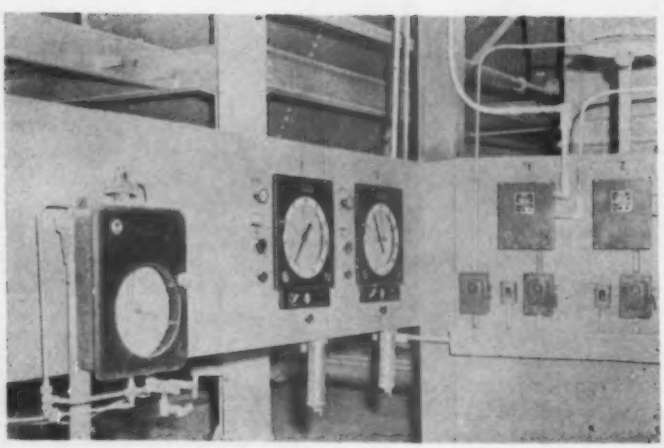
Enter 106 on card, page 217

At the plant dock, oyster shells are unloaded to stockpiles by a crane mounted on a barge. Another crane, foreground, feeds the washing plant and the feed hopper to the plant.





Gulf. All washing of the shell is now done at the dock. But the two dredging companies are now equipping their dredge with special improved washing facilities.

The shell is transferred from the barges to stockpiles by a Bucyrus-Erie crane with a 3-cu. yd. clamshell bucket mounted on a barge. This crane is also used to feed shell from the stockpiles to the washing plant. The latter consists of a 15-ton hopper over a Tyler Ty-Rock screen equipped with ½-in. wire cloth and ¾-in. washing sprays. The fines, mostly silt, are pumped to a waste sump. A conveyor discharges the washed shell to a pile, from which it is distributed by a bulldozer.

After ample time for natural drying, the shell is fed by a Lima crane with a 1¼-cu. yd. clam to the 10-ton plant feed hopper. A belt conveyor discharges the shell, *via* a split chute, into the two compartments of the 500-ton kiln-feed bin. A combination of Syntron vibrating feeders and rotary weighing feeders is used for accurate feed control to the two rotary kilns.

The 7- by 120-ft. Allis-Chalmers kilns have 6-in. brick lining—high-alumina in the burning zone and high-grade No. 1 elsewhere. Each is driven by a 40-hp. variable-speed slip-ring motor through reducer and gear. The kiln speed range is from 30 to 70 r.p.h., but 55 to 60 r.p.h. has been found most satisfactory.

Natural gas fuel is used, with a flame safeguard on the burner and a gas flowmeter for control. A 1,350 deg. exit gas temperature is aimed at, with limits of 1,300 to 1,400 deg. F., for best results. This objective results in an average burning zone temperature of about 2,200 deg. F. Control is primarily through variation of the shell feed rate. Pressures are about minus ½ in. water gauge at the hood, 3 in. forced draft at the firing end of the kiln,

Left, middle: A plant view from the feed end of the kilns, showing the 500-ton feed bin, the feeders, the draft fans, the spray chambers, and the stacks.

Left, bottom: The kiln control board with draft and temperature recorders. The main switchboard is at the right.

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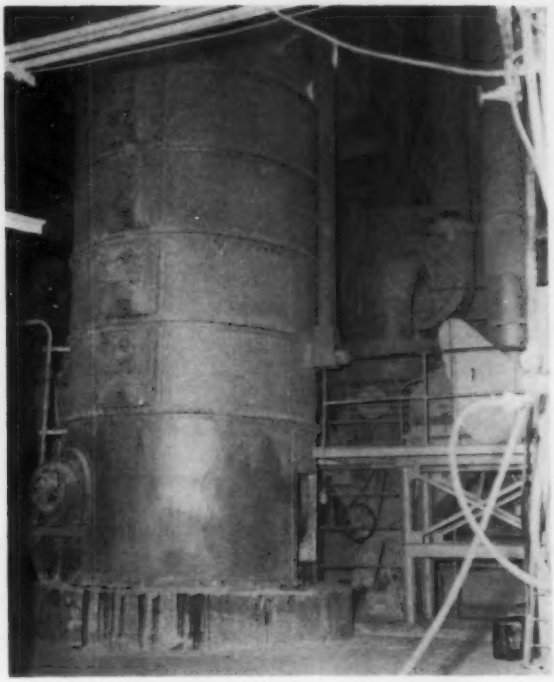
The pulverizer, which can be used for quicklime reduction or by-passed, as desired.



The 15-t.p.h. continuous hydrator, which has automatic feed and temperature control. The hydrate pulverizer is in the background.

and 5 to 6 in. at the feed end. Under these conditions each kiln produces about 4¼ t.p.h. of lime at a fuel rate of 31,500 cu. ft./hr. of gas.

The kiln exhaust gases, with a temperature of 280 to 350 deg. F., leaving the kiln, are preconditioned in dust chambers equipped with sprays and baffles. Fans driven by 30-hp. motors draw the cooled gases and exhaust them through 60-ft. steel stacks.

Individual cross screw conveyors feed the lime from both kilns to a main screw conveyor — all water-jacket cooled. A bucket elevator discharges the lime to a 2-deck Universal vibrating screen with ½- and ⅛-in. openings on top of a 200-ton circular steel silo. This is bulkheaded for the storage of pebble lime on one side and hydrator feed on the other. The plus ½-in. and minus ⅛-in. lime from this screen is hydrator feed. The ½- to ⅛-in. over the bottom deck is pebble lime. This material is drawn from storage on a belt conveyor for direct bulk loading into trucks. A screw conveyor can discharge direct from storage to a pulverizer or go *via* a bucket elevator into one of two 70-ton outside bins. The quicklime pulverizer can also be fed from the bins. From the bins material can be loaded directly to bulk trucks or fed to a St. Regis 2-spout packer.

Lime to be hydrated is drawn from the other half of the silo to a screw conveyor and bucket elevator to a 5-ton surge bin. This has top and bottom Bin-Dicators which flash lights for normal control of feed. From this bin a U.S. Varidrive conveyor feeds the lime at the desired rate into the supermixer of the Schaffer continuous hydrator. Water is sprayed in at the exhaust and feed stack. Temperature is controlled by a Bristol pyrometer. Capacity is 15 t.p.h. of hydrate. The product is carried by a screw, an elevator, and a screw series to an 8-ft. Sturtevant separator. From this point the finished hydrate is discharged into a 143-ton bin.

Rejects from the separator go to a No. 3 Raymond impact pulverizer with Whizzer blades. Rejects return through the mill. A fan feeds the mill product to a cyclone collector and into the same 143-ton bin. Over this bin is a Raymond cloth bag collector, to relieve air pressure.

Hydrated lime is fed from the bin into two St. Regis 2-tube packers. The bags go *via* gravity roller conveyor into the warehouse. There the bags are stacked on 4- by 4- ft. wooden pallets holding 60 bags (1½ tons) each. Clark and Allis-Chalmers rubber-tired forklift trucks store these three high or load them direct to cars or trucks. The warehouse has a capacity of 1,500 tons. About 80 percent of the bagged hydrate is palleted and pallets are returned by the customers on an exchange basis.

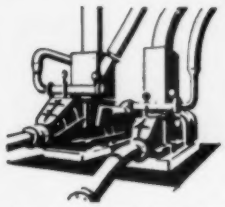
There is also provision for direct bulk loading of hydrated lime by means of a screw conveyor under the storage bin. Trucks are loaded direct and there is a loading dock nearby for transferring into cars.

Five G.M.C. tractors with flat-bed trailers are used for delivering bagged and palleted lime. Another G.M.C. with a trailer-mounted all-aluminum tank of 18-ton capacity is used for bulk lime. This unit has an unloading screw. A 14-ton dump truck delivers pebble lime. The trucks are loaded at night and covered with tarpaulins for delivery the next day.

Officers of the company are: Anthony Guarisco, president; John Guarisco, vice-president; and Roland Verret Jr., secretary-treasurer. Ernest May, plant superintendent, has had 18 years experience in lime manufacture.

FULLER EQUIPMENT

for the process industries



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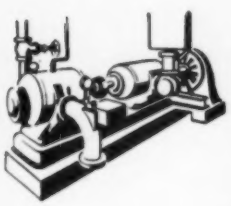
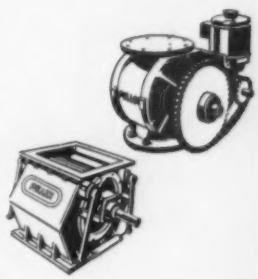
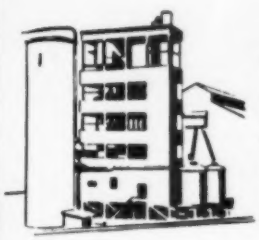


Fuller Rotary Compressors and Vacuum Pumps are vibration-free, can be installed anywhere, even on balconies. Fewer moving parts mean minimum maintenance. Compressors and Vacuum Pumps handle air and gases from 30 to 3300 cfm at pressures to 125 lb. gage. Vacuums to 29.95 in. (referred to 30-in. barometer).

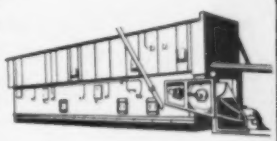
Fuller Vane-type and Roll Feeders . . . for volumetrically controlled feeding of a wide range of dry pulverized or granular materials. Also Fuller Rotary Valves . . . used under silo deck slabs and bins to permit the free flow of pulverized materials which tend to arch, such as lime and cement raw materials.





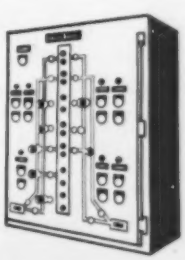
Fuller Preheaters, Humboldt Suspension Type . . . for preheating dry, pulverized Portland cement raw materials with rotary kiln waste gases.

Fuller Horizontal and Inclined Grate Coolers are compact, easily installed for fast, efficient cooling of materials such as nodulized phosphate rock, pebble lime, ores, dolomite, iron nodules and Portland cement clinker from 2800°F. or higher to any desired point within a reasonable range of atmospheric temperature.



Fuller-Material-Level Indicators signal audibly and visibly when materials reach a predetermined high or low level. Controls conveyor motors, valve circuits, etc.

Fuller Control Panels permit automatic, remote, one-man control of multiple operations. Easily-read panel permits visualizing flow of material to storage or from process bins.



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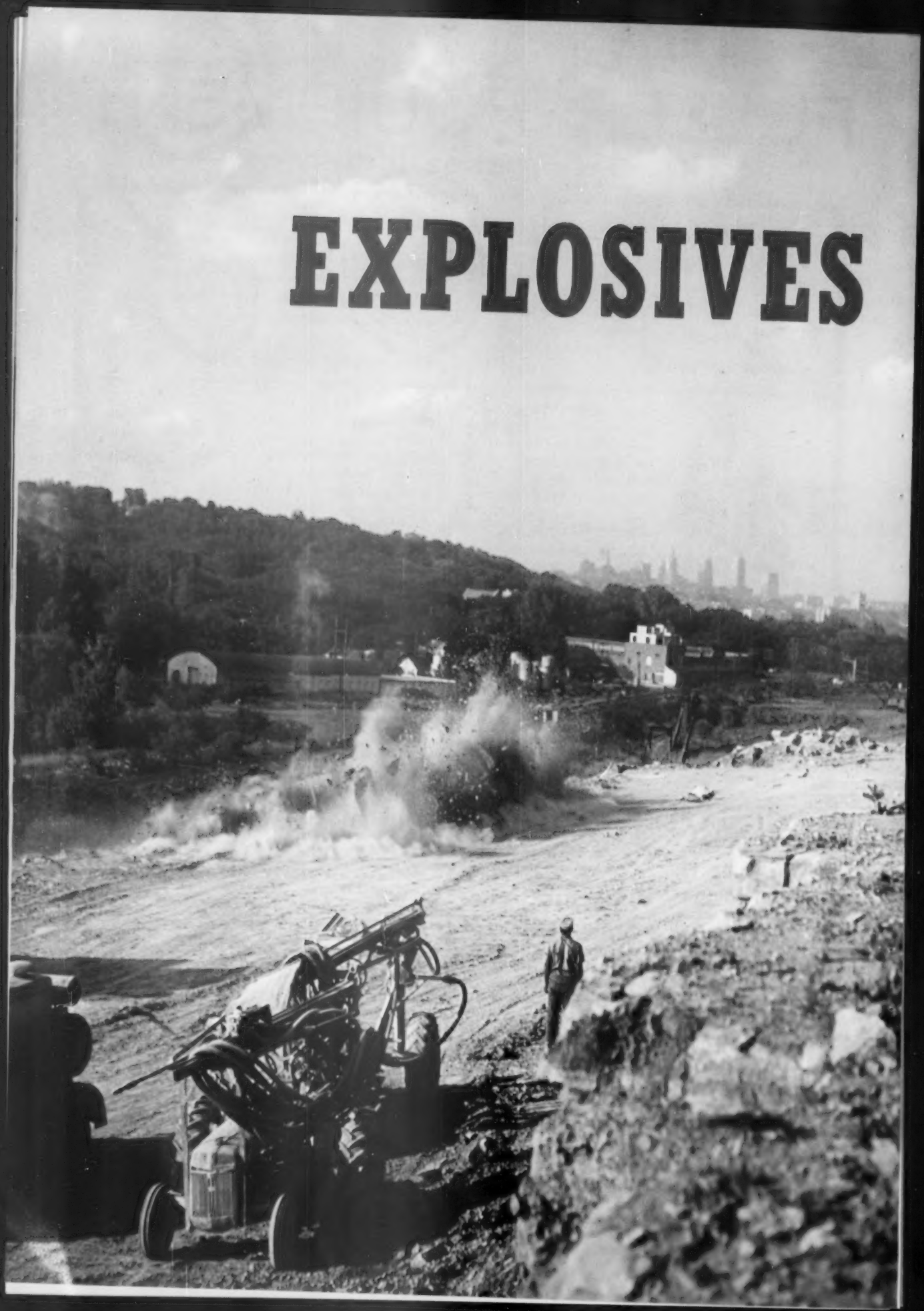

ENERGY...

Have you checked into the many ways it can handle work that used to be done with mechanical energy . . . and do it cheaper, faster, more efficiently?

Lower TOTAL job costs can be your reward for examining ALL the ways in which explosives energy can work for you. For example, the J. A. Tobin Construction Company of Kansas City, Kansas did just this. On a section of the Turkey Creek Expressway, Interstate 35, there were no nearby homes or confining obstacles, so the objective was maximum breakage and production on every shot, together with efficient use of equipment. Gianite ammonium nitrate blasting agent was chosen for the task—low cost, ready to load, but with the wallop needed to do the job.

For this contractor, selection of the right primers, blasting agents, and blasting techniques meant more thorough and consistent breakage, more payload work out of each piece of his equipment, and minimum downtime from end to end of the job. This is just one example of efficient use of explosives energy. Others? . . . of course!

In coal stripping . . . with the help of the Atlas Representative, one operator discovered a way to eliminate almost one-half the total mechanical handling of overburden. He used explosives force to move rock directly to the spoil pile.

In open pit ore mining . . . production has been speeded, costs cut by "designing" the blast to create additional fragmentation, allowing much of the rock to bypass the primary crusher.

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If you haven't checked your blasting methods lately, perhaps there's a new one Atlas can tell you about—the one that may be exactly the answer to help you reduce your overall costs. Look to Atlas' full line—the only full line in the industry. New, modern facilities are now in production at Joplin, Missouri to assure ready availability of all products. And to give you faster, more flexible local service, new distribution facilities are being established coast to coast. For assistance, call in your Atlas Representative, or write directly to:

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C 158-1

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Mr. Deely's discussion of agstone sales promotion during the last annual meeting of the National Limestone Institute presented some interesting perspectives on the subject. The accompanying article, based on his talk at that meeting, is presented on the premise that Mr. Deely's analysis of promotion and profit factors is highly pertinent and will stimulate among agstone producers throughout the country a new scrutiny of their respective approaches to this material and its marketing.

By JOHN M. DEELY JR.

Lee Lime Corporation
Lee, Mass.

Agstone Promotion— Is It a Sound Objective?

Sales growth atrophies in negative atmosphere

PRIOR to discussing sales promotion of agricultural limestone in our marketing area, I would, without being facetious, like to propound the question: "Is it sound to promote the sale of agricultural limestone in my area or any other area?" The answer to this question is far from clear to me as a producer. To the agronomist, who has been most helpful in developing the sound story on the need for limestone; to the state universities; to the various governmental agencies; to the bankers; to the fertilizer companies; and, most importantly, to the ultimate consumer, the farmer—the need for limestone is increasingly obvious and necessary. As a result, the use of limestone should continue to grow—all other factors, such as the continuation of the Agricultural Conservation Program, as well as the state of the economy, being equal or expanding.

This, then, is a market analyst's dream. All the ideal factors for growth in sales of a product are present in the case of limestone. The technical authorities are unanimous on this point—twice as much tonage should be applied as is now being applied. The nutritional benefits derived from limestone are stressed, as well as the factors of increased yields, replenishing of minerals, sound investment and the like. The farmer consumer is being educated and is becoming increasingly aware of the vital role of limestone, particularly in the realm of economic returns to him.

However, there is one vital (negative) segment missing in the rosy picture just outlined—the producer of this wonder product whose tonnage shipments of agricultural limestone should and eventually will be doubled. Representing one such small manufacturer, I say strongly, "Have you analyzed on a cold-blooded basis, your profit return from this product over a period of, let us say, the last five or six years?" I am sure you all have, and perhaps you are not as disturbed as I am. In order to refresh our thinking, let us use our tonnage and profit trends as a guide.

Take as a base your total limestone shipments into agriculture for the years 1952, 1953 and 1954. I selected these years because in our case shipments in each year were quite uniform and did not reflect any strong trend either up or down. Add up your shipments for each of these years and divide by three. This average establishes your base—assign it a value of 100. Then each prior or succeeding year's limestone shipments will vary over or under the basic figure.

For example, Lee Lime Corporation's shipments declined by five percent in 1955 to an index of 95. In 1956 we advanced by 26 percent over the base period to an index of 126. In 1957 our index grew to 146. It was off in 1958 (to 131), up again in 1959 (to 146), and in 1960, up to a record high of 159.

As one more item of potential interest, in the base period of 1952-1954, bagged material accounted for 47 percent of total limestone shipped by us and, interestingly, has grown a bit; but the actual percentage of bagged materials has declined to 35 percent of the limestone shipments in 1960 despite our over-all increase in tonnage (59

percent) as contrasted with the base period.

But now the crux of the problem and the reason for my question: "Why should we bother to promote the sale of limestone?" We arrived at an average profit per ton of limestone for the base period 1952-54 and again assigned a value of 100 to this average. During the succeeding years, 1955-60, our percentage of return per ton of limestone, instead of increasing with larger volume, went sharply in the other direction to a low point in 1960, when our profit index was 58. In other words, our profit per ton declined by 42 percent while our volume was increasing 59 percent. Apparently, we . . . have worked long and hard and have not accomplished too much for our stockholders.

If limestone is to be soundly promoted—and, of course, it should be—costs of promotion must be accounted for, as one accounts for manufacturing costs and administrative overhead. Specifically, we budget on the basis of a total sales cost of 16 percent of net f.o.b. sales of limestone at the plant, combining direct cost of sales in the form of commissions to items of advertising in its various facets. In other areas where limestone tonnage sold is many times the volume sold in our section of the country, this percentage figure for total sales cost will be lower for the (individual) large-volume producer.

In the Northeast, and perhaps throughout the country, there are two basic types of limestone producer. First, there is the manufacturer to whom agricultural limestone is a by-product of his major business—for example, road metal or burned lime. The other type of manufacturer, like our own firm, considers agricultural limestone as a primary product, not a by-product. On a competitive basis, we must, insofar as possible ignore the by-product price and concept of operation and attempt to market our material in such a fashion that our higher-priced limestone will sell successfully in the same market with the so-called by-product or waste limestone.

We feel very strongly that a continued increase in limestone tonnage will be assured when all manufacturers, whether they are by-product operators or not, take pride in this vital chemical product, limestone, and when they either initiate or expand sound promotional programs of their own. It is to the detriment of each and every one of us as producers that we are cutting our own throats because of our attitude toward limestone.

All of us have helped foster the idea of the cheapness of lime, so that now our customers are only too willing to agree with us! The tremendous benefits from lime application are lost in this negative approach.

In our firm we have a few cardinal rules which have assisted us in promotion:

1. We recognize that the government program is the backbone of our present limestone business.

2. If you believe in promotion, work in your area for a Purchase Order, as contrasted with a contract form of award.

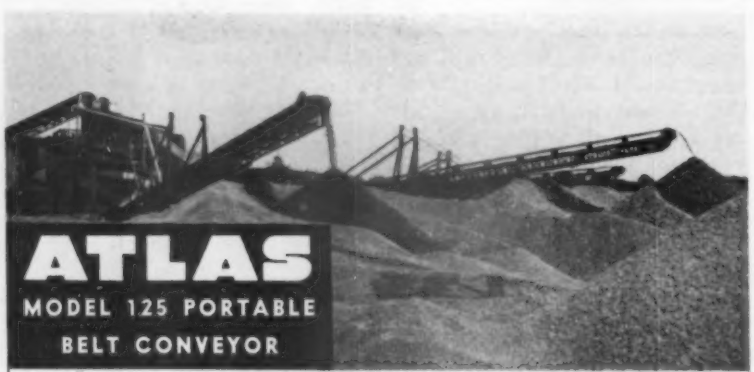
3. Have your salesmen specialize in limestone sales only. In areas where we have followed this specialization of sales efforts, tonnage increases are approximately *three times* the rate of increase in areas where our salesmen also handle the multitude of other products which we manufacture and sell in fields not directly connected with agriculture.

4. There is no substitute for down-the-road calls on farmers. This holds true whether you are selling directly to the ultimate consumer or developing an order for a local retailer or wholesaler.

5. In marketing we try to keep a balance between sales direct to the consumer, as contrasted with those to dealers or wholesalers. For example, the first reaction of a local dealer, who has not been active, to a direct sale "in the backyard" is one of irritation. Fortunately, however, the stimulation will wake up the dealer to help sell your product for you.

6. Wide use of direct mailings

(*Concluded on page* 130)



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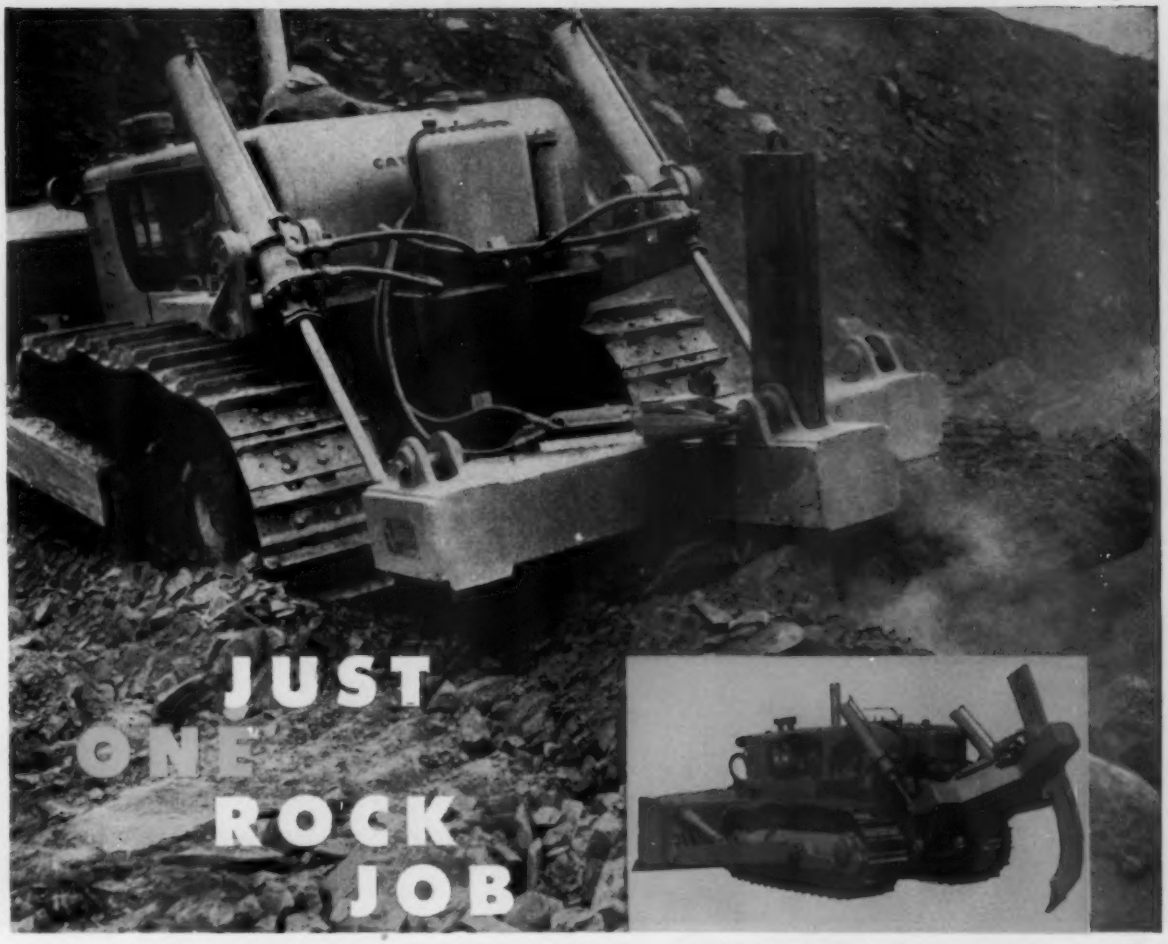
Manufacturers of portable and stationary conveyors and bucket elevators for handling loose material such as sand, gravel, crushed stone, coal, coke, cement, etc.

Enter 116 on card, page 217



can pay for a D9 and Kelley Ripper!

The Extra-heavy Duty Kelley Ripper makes full use of the power and traction of the Cat D9 Tractor to slice through rock at seven foot depths.

■ Go ahead — bid that rock job the way you always have. Include the cost of drilling-blasting equipment and crews, the increased insurance premiums, the reduced production that comes with hard-to-handle materials.

Yes, go ahead and bid it as before, *but do the work with a Kelley Ripper!*

Teamed to the rugged power of a Cat track-type Tractor, the Kelley Ripper shatters most any rock, frost, hardpan into easily loaded pieces. Ripping costs with a Kelley are but a fraction of those of drilling-blasting. You can save enough on just *one* rock job to pay for a D9 and Ripper!

Ask your Caterpillar-Kelley dealer to prove it. There's no obligation.

LOOK at these Kelley Ripper savings:

Job Location	Material	Ripping Costs (Cents/ Cu. Yd.)	Drilling and Blasting Costs (Cents/ Cu. Yd.)	Savings (%)
Oklahoma	Limestone	7.3	17.3	58.4
Texas	Limestone	5.2	15.1	65.6
California	Sandstone	15.0	30.0	50.0
Kansas	Sandstone	2.1	11.7	82.1
Ohio	Sandstone	5.7	13.8	58.7
Pennsylvania	Limestone	11.5	19.3	40.6
Virginia	Sandstone	8.6	15.7	45.3
Minnesota	Frost	25.0	60.0	58.3
Minnesota	Paint Rock	6.1	54.5	88.8

There's a Kelley Ripper for every Caterpillar track-type Tractor . . . ask your Caterpillar-Kelley dealer.

KELLEY RIPPER C R C

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Private enterprise is turning South Korea into an industrialized, highly productive country, to the benefit of all her people.

This is exemplified by the Mungyong plant of Korea Cement Manufacturing Company, Ltd., which operates two F.L. Smidth rotary kilns, each 3.15 • 2.85 • 3.15 metres dia. x 123 metres long.

"MAGNECON" kiln liners, uniquely the product of Canadian Kilmar magnesite, are used in the hot zones of these kilns.
The "MAGNECON" liners contribute substantially to economy of operation by giving roughly five times the service life of previously-used refractories.
A recent report from Korea Cement, covering 335 days of service, concludes "The quality of 'MAGNECON' is superior and satisfactory."

CANADIAN REFRACTORIES LIMITED
CANADA CEMENT BUILDING, MONTREAL, CANADA

Write for technical folder "'MAGNECON', the hot zone refractory to keep your kiln on the line".

2318

New Facilities Planned By Baukol-Noonan After Purchase of Molite

Baukol-Noonan, Inc., Noonan, N. D., has purchased the plant and properties of Molite, Inc., Mandan, N. D. Both firms are producers of lightweight aggregates.

Officials of Baukol-Noonan have announced plans for the complete reconditioning and remodeling of the Molite facilities. A pre-sizing plant will be installed (including a crusher, conveyors, and screens for raw products) and also a new sizing plant for the finished product. This product will be known as Noonlite.

The new facilities will also permit an increase in production and sales of structural concrete in addition to the former block manufacturing. The Mandan plant will be managed by James Emil.

New Corporate Name Chosen By Keil Stone and Gravel

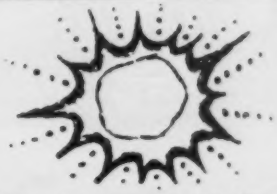
Keil Stone and Gravel Corporation, Hudson, N. Y., is now conducting business under the new name of Keil Contracting Corporation. The corporate structure was not affected.

The firm was established in 1921 as a sand and gravel company, but has expanded more and more into the general contracting field. The new name was chosen to conform with the services Kiel renders.

The Georgia Marble Company, Tate, Ga., one of the nation's largest producers in its field, has announced plans to construct a mineral processing plant in Adams, Mass. Nelson Severinghaus Jr., production manager of the firm's calcium products division, estimates that 15 to 20 persons will be employed in the new marble grinding operation.

Lambert Brothers Division of Vulcan Materials Company, recently opened a new quarry in Knox County west of Knoxville, Tenn.; deliveries of crushed stone and agricultural limestone are already being made from the Dixie-Lee quarry.

The Getman Brothers' KD-5A Scoot-Crete uses an air-cooled Deutz Diesel.

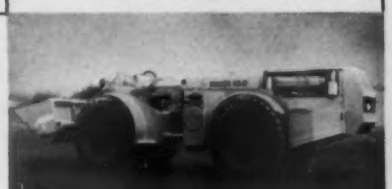


Reason: no warmup needed. Runs effectively from 40° below to 140° above (and it's approved by the Bureau of Mines.)

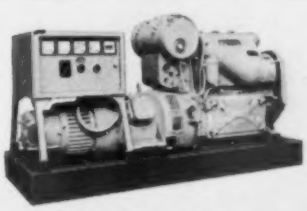
Fuel goes farther—every drop is burned.

So there's less down time—no sulphurous acid condensation—hardly ever a carbon job.

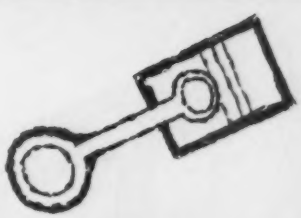
No water system; maintenance bills go down. You get full H.P. rating; no power lost for cooling.



Good reasons why Wagner ore carriers, Wagner scoopmobiles, the Jones Jackass and the Young Shuttle Buggy run on Deutz Diesels, too.



Deutz air-cooled Diesels are also used on generators, compressors, stand-by power equipment.



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PARTIAL MODEL	SPECIFICATION BHP	TABLE RPM
F1L 712	13	2300
F2L 712	26	2300
F3L 712	39	2300
F4L 712	52	2300
F6L 712	78	2300
F/A3L 514	48	1800
F/A2L 514	32	1800
A4L 514	72	2000
A6L 514	110	2000
A6L 614	110	2000
A8L 614	145	2000
A12L 614	220	2000
A6L 714	125	2000
A8L 714	168	2000
A12L 714	250	2000

Full range: 5 to 250 BHP in 1, 2, 3, 4, 6, 8, and 12 cylinders.

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Please send catalogs covering the range I have checked.

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New Metallurgical

On the right, raw, and on the left, finished material storage. The design of the plant comprehends future expansion of these two departments, as well as additional calciners, within a compact layout.

Below: Straight south, and within visual distance of Terminal Tower in downtown Cleveland, Cuyahoga Lime's new 400-t.p.d. metallurgical lime plant sits on the doorstep of a large part of the area's steel industry which it serves. Just to the right of the inclined conveyor is the line of four vertical kilns now in operation.

Lime Plant Serving Major Steel Center

Cuyahoga Lime in Cleveland enjoys advantages in locale, market, shipping methods

By BUREN C. HEROD

ANOTHER ON THE SPOT report

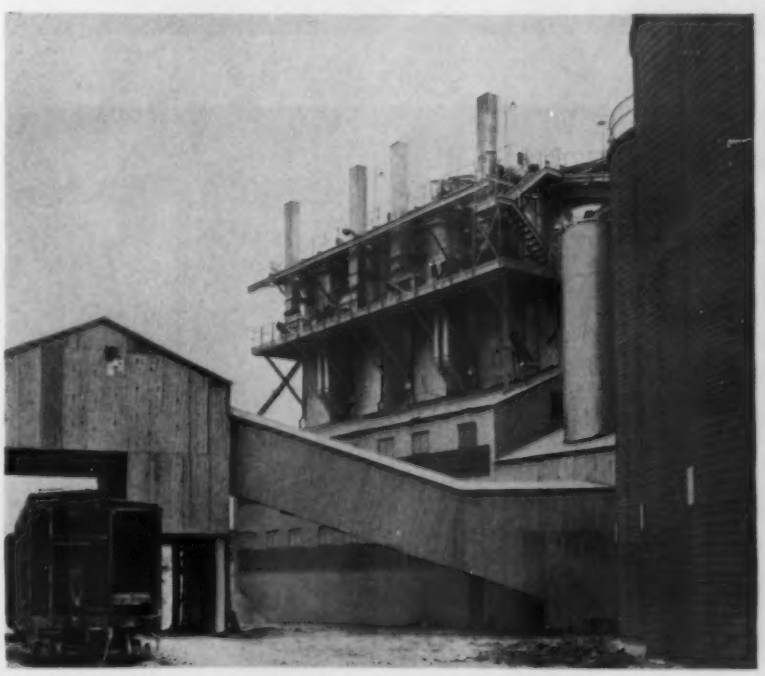
SITTING literally on the doorstep of the industry it serves, the Cuyahoga Lime Company represents the matching of top lime production efficiency with far-sighted planning. Cuyahoga, a newcomer in the metallurgical lime field, was formed by two established companies in the business, Minerals & Chemicals Philipp Corporation and Neville Lime Company of Ohio.

A study of the Cleveland area's steel industry made by company officers disclosed that a lime producer in the immediate vicinity would enjoy significant advantages. The existing market was healthy; the potential was high—particularly in the expansion of the number of furnaces using the basic oxygen process; and the flexibility of shipping methods was assured through availability of river, rail, lake, and truck routes.

Also significant was the fact that the raw material for the calcining operation could be economically transported by lake boat from the point of origin to a Cleveland dock. (Cuyahoga does not quarry its raw material but acquires the stone, sized, from the Presque Isle Corporation.)

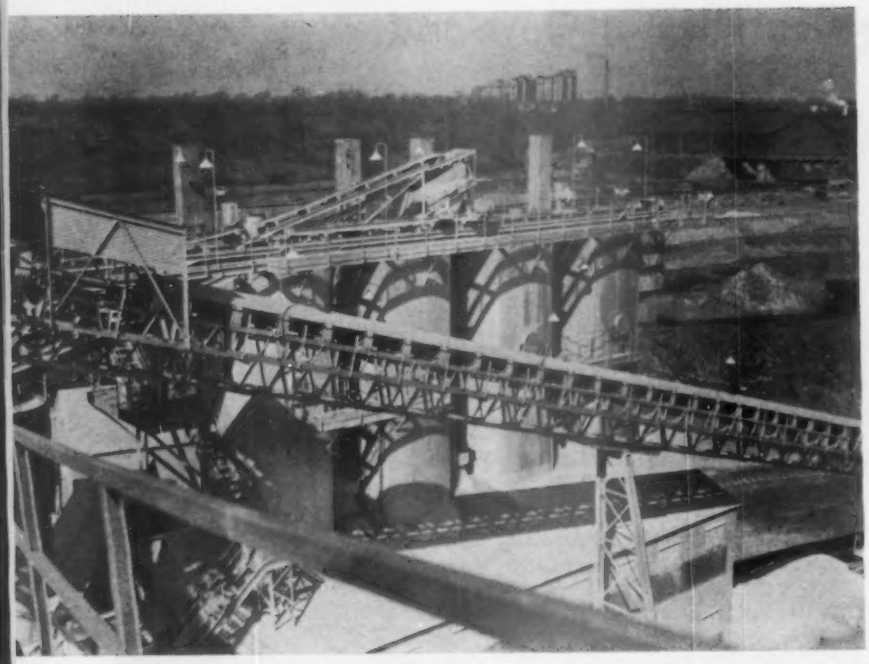
With the above factors established, the company's organizers proceeded with the purchase of property in an industrial section exceptionally convenient to major steel furnaces, and with the planning of an installation that would effectively service current markets and which could be readily expanded to accommodate potentially greater demands.

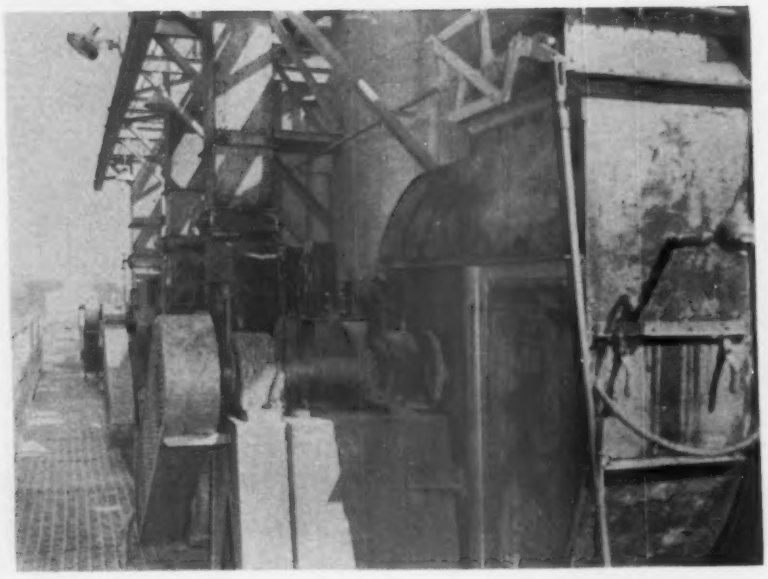
The tract acquired is on the Cuyahoga River, a short distance upstream from the lakefront dock areas, where it is situated between two mainline railroads and within a half mile of primary truck routes. These highly favorable conditions for distribution were matched with



Right: Finished lime is loaded into rail or truck equipment through a turnhead chute in the structure at the left. The loadout conveyor is equipped with a belt scale, and tonnage is totalized on a recorder on the No. 1 panel in the kiln department.

Reclaiming gates and conveyor in the tunnel below the raw stone storage.





the construction of a highly automated production facility incorporating four 100-t.p.d. calciners of proven high efficiency. (Cuyahoga's vertical kilns are comparable in all major respects to the high performance units installed a few years ago at the Strasburg, Va., plant of Chemstone Corporation, a wholly-owned subsidiary of Minerals & Chemicals Philipp Corporation.)

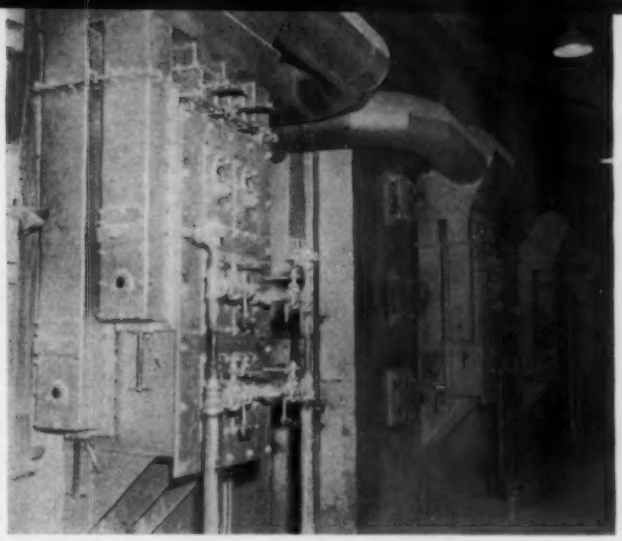
Designed by Chemstone Corp. personnel under the direction of W. A. Roberson, chief engineer, the Cuyahoga installation displays a highly efficient and compact layout. Careful planning is evident in the fact that only two men per shift are required to handle all phases of the operation, from raw material distribution to finished product loading. Calcining operations were naturally paramount in engineering the new plant; however, material-handling systems were also given particular attention since seasonal lake shipping necessitated an installation that would provide for automated handling of kiln feed from a stockpile area adequate to service production requirements.

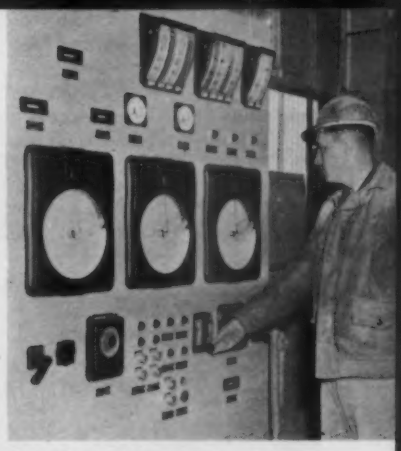
Construction of the plant, which is not yet a year old, was started last June 14 by the general contractor, J. G. Kassab, Inc., of Pittsburgh, Pa. On January 9 of this year, the first of the four calciners was put in production.

Although the property is well located, there was one problem in the construction. Subsoil was such that a total of about 7,000 ft. of piling had to be sunk for the foundation of the kiln and product silo structures and the supporting columns of the raw stone distribution gallery.

Left, middle: At the center is the primary feed conveyor on which stone is carried from the storage reclaiming system or from the truck dump hopper. In the background, mounted above the row of kilns, is the tripper conveyor, with integral screen, that feeds the kilns. The screen removes fines from the kiln feed.

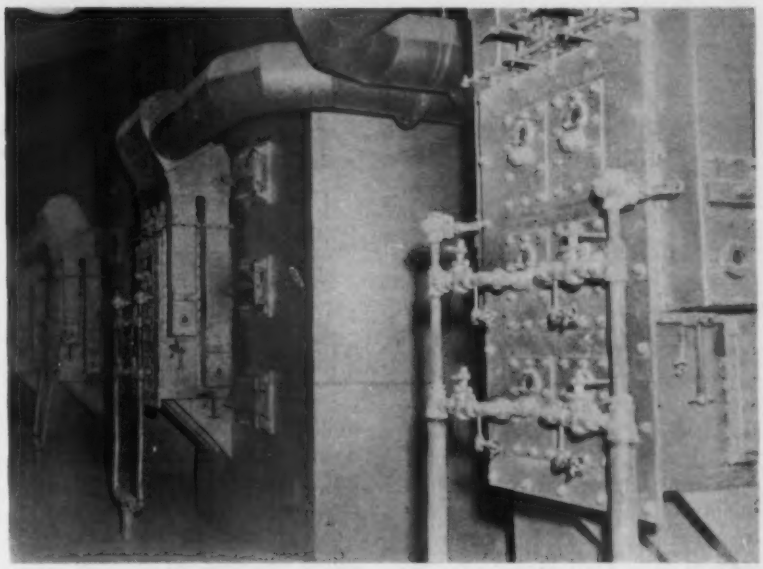
Left, bottom: Both exhaust and primary air fans are installed at the off-take pipe level of the kilns. Close draft control is one of the most significant factors in the high performance of these kilns.





Right: Bill Herold, plant superintendent, at the control panel for No. 1 kiln. This panel differs from the remaining three only in that certain controls relative to the entire operation are included in addition to the kiln's individual system.

Front (above) and rear (right) view of the kilns on the firing floor, showing the air manifolds and gas lines supplying the burners. Each air manifold and gas line may be individually regulated.



Design Points As seen in accompanying photographs, structures for each of the three primary phases—raw stone distribution and storage, calcining, and finished product storage—were designed to permit future expansion with no interference between phases or interruption of existing handling and processing systems.

Aside from the calcining operation, described later, the flow has a number of important and interesting refinements. The stone hopper provided for receiving truckloads of stone from the lakefront dock is equipped with a pair of Robintronic bin level indicators. They are installed at points that represent a 40-ton charge between the two. When this amount is present in the hopper, a signal appears on a panel on the burning floor to indicate to the operator that the kilns may be charged directly from the hopper if desired, in lieu of drawing from storage.

Two points in the raw stone system are also provided with ABC's conveyor scales. One of these units is installed with the plant feed conveyor (supplying both kiln charging and storage systems), and the other with the reclaiming conveyor system under the raw stone storage. These furnish tonnage totals for

In an automated procedure, all four vibratory feeders below a kiln's cooler sections are actuated simultaneously for pre-set periods at regular intervals. The lime is discharged into the underlying gauging hopper and then passes to an apron conveyor.

Three finished fractions separated on the two finishing screens are placed in the three storage silos. Fines are conveyed by screw to a bin for subsequent processing.

Above: The draw points and vibrating conveyor below the three finished product silos. Any fines created in this handling are removed on a perforated plate screen installed in the final 5 ft. of this conveyor.

both plant input and raw material inventory usage. A third conveyor scale totalizes tonnage passing over the belt supplying the rail- and truck-loading station.

A considerable part of the high quality of finished materials is due to provisions made for removing fines at both ends of the process. A screen, integral with the tripper conveyor system that charges the kilns, removes fines prior to kiln charging. Removal of fines from finished products, as these are recovered from storage, is accomplished through a screen section in the vibrating pan recovery conveyor.

An impressive element in the over-all automation and remote controlling system is the kiln charging control. With a master selector switch set to a desired quantity of stone, the operator then actuates an individual control on the appropriate kiln control panel, and the charging tripper moves across the top of the kilns (see accompanying photograph) to the designated kiln. Limit switches for tripper travel and charging valves will not permit the trigger to be positioned incorrectly—it cannot be positioned between charging points—and the belt will not discharge material until the charging valve has opened. To similarly charge another kiln, the operator need only actuate the control on that kiln's panel. (Charge tonnage is set on a master selector.)

Aside from the kilns, standardization was made on handling equipment and drives in all phases. With two exceptions, the conveying systems throughout the operation are comprised of Fairfield conveying and elevating components. All equipment drives and power centers were supplied by Westinghouse.

FLOW

Raw Material Stone received from Presque Isle is a high-calcium material (see PIT AND QUARRY, October, 1955, p. 56), which averages more than 97.5 percent $CaCO_3$, as received at the Cuyahoga plant. It is sized for kiln feed of about 3 by 2 in.

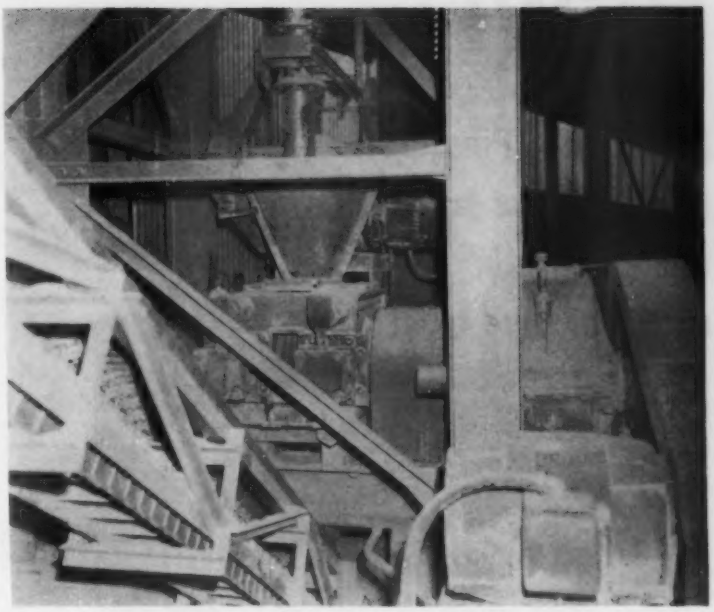
From the receiving truck hopper it is transferred on a short feeder belt to the plant feed conveyor. At a transfer point the latter discharges the feed through a pants-leg chute from which two separate systems are supplied. In one, for direct charge of the kilns, stone is conveyed to the Universal Engineering tripper mounted on top of the kilns. In the other route, material is placed on a belt and carried to the distributing conveyor in a gallery above the stockpile area.

The tripper in the approximately 240-ft. long gallery can create a stockpile of about a 100,000-ton capacity. The present gallery was built so that a future extension can be made in the opposite direction from the point of present material transfer.

Below the stockpile is a concrete reclaiming tunnel housing a battery of drawpoints set on 15-ft. centers. These are fitted with manually operated gates and chutes that discharge onto the first unit of the reclaiming conveyor system. The second unit discharges to the plant feed conveyor in closing the charging, stockpiling, and reclaiming systems.

Above the kilns, as indicated earlier, the kiln feed is discharged from the tripper over a screen before entering the feed holes. The 3- by 6-ft. Simplicity single-deck

Fines removed in the screening of finished products are delivered to the briquetting machine, left center, and the briquets are then raised by bucket elevator to the screens.



screen separates minus 1-in. fines which are conveyed to a "blister" bin for subsequent disposal.

Kilns Feed openings at the tops of the kilns are small, only 14 in. in diameter, and pivoted closing plates are pneumatically operated. Positioning of the tripper to charge any kiln may be done by the remote system noted previously, or manually from the top of the kilns. For the latter procedure, local control switches have been provided (again, limit switch arrangements will prevent incorrect positioning of the tripper), and a high level material indicator is provided at the top of each kiln.

The four calciners, incorporating largely construction and operating features developed by Mr. Roberson, are built of 5/16-in. steel plate lined with refractory to various thicknesses in different zones; they are fired with natural gas, and operate on the slip principle.

Refractory lining extends from the top down to the exhaust gas offtake pipe and increases in thickness from that point down to the burner ports. In the cooling zone the lining is somewhat thinner. The calcining zone is approximately twice the height of the burner port brickwork system.

Offtake pipes are fitted with automatic spray systems to protect the exhaust fans from excessive temperatures. The latter are Buffalo Forge fans of high-temperature construction and are specially designed to meet the operating conditions required.

The combustion air fans are mounted at the same level as the exhaust fans. They are also Buffalo Forge units but have smaller design ratings than the exhaust fans. Air is delivered down through the duct work to manifolds at the front and back of each kiln. The combustion zone is divided, and each division is served by separate burner groups. The burner ports are supplied from manifolds which have sliding gates to control the individual air streams. The gas inlets into the manifolds can be individually regulated to obtain the controlled gas flow to each burner.

The internal quadrants continue down from the combustion zone through the cooling zone, and draw is made by a Jeffrey vibrating feeder under each cooler section. All four feeders under each kiln operate simultaneuosly and discharge into a 4-compartment removable surge hopper. The latter is used for gauging volume — the draw is not weighed.

Instrumentation and control of the calcining operation is based on Bailey pneumatic controlling and recording systems. Air for these is provided by a 60 c.f.m. Worthington compressor. In normal operation, calcining is controlled automatically in accordance with O_2 determinations made by a Bailey gas analyzer. The oxygen control, which pneumatically regulates dampers on both exhaust and combustion fans, may also be set to a desired constant.

Fired up only a short time ago, the kilns are expected to exceed design and performance standards. Several factors contribute to their high performance. Close draft control is one of the most significant, aided by construction design features that provide a nearly airtight system in which smooth burning can be maintained.

The small feed opening minimizes heat loss, leakage of air, and draft variations during the charging periods. In addition, when the charging gates are opened, a bypass in the main gas line to each kiln is automatically brought into play—a reduced flow of gas is thus provided and in lieu of interrupting combustion during charging, calcining is maintained.

Both the calcining control and the cleaning of the kiln feed contribute to product quality. Loss on ignition of quicklime discharged from the coolers averages only about 2 percent.

The individual control panel for each kiln is equipped with the following instrumentation: gas flow (front and rear); air flow (front and rear); top and bottom draft; exhaust gas, calcining, and cooler temperatures; stone tonnage counter; and cooler draw timer control. On the panel for No. 1 kiln certain controls and instruments for the entire operation are provided. These include tonnage totalizers for all systems and for the lime loadout belt, temperature recorder for all coolers, tonnage selector switch for

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feed to all kilns, and control for the automatic positioning of the kiln feed tripper conveyor.

Product Processing Drawing lime from the coolers is also an automated procedure. A Flexopulse timer on each kiln panel is set to activate all four Jeffrey feeders under the coolers of a given kiln for a certain number of seconds at regular intervals. The lime is discharged into the surge and gauging hoppers, which are equipped with bottom gates.

From the hoppers the product is received on a 30-in. apron conveyor and transferred to a double-roll 24 x 30 Jeffrey crusher. The latter discharges to a bucket elevator in which the crushed lime is raised to a screening phase. Separation is made on a pair of Tyler Hum-mer screens mounted in series. The elevator discharges to the first screen, a 4- by 10-ft. double-deck unit currently fitted with ¼- and ⅛-in. opening screencloth on the top and bottom decks, respectively.

Minus ⅛-in. fines are delivered by screw conveyor to a 60-ton capacity fines bin. Material retained on the bottom deck is chuted into an underlying storage silo, and the top-deck fraction passes to the following 4- by 5- ft. single-deck screen. Here the lime is separated on a 1¾-in. cloth, each of the two fractions being conveyed on separate belts to discharge into an appropriate silo. The preceding screens and conveyors are housed above the row of three Marietta silos. These storage structures are about 50 ft. high, 24 ft. i.d., and each accommodates 350 tons of finished product.

Material is drawn from the silos through rack-and-pinion gates onto a 24-in. HMV Jeffrey vibrating pan conveyor. As indicated earlier, fines are removed from the finished products through a 5-ft. long section of 5/32-in. perforated screen plate at the discharge end of the vibrating conveyor. These fines are passed by screw conveyor to the bucket elevator for return to the screens and ultimate transfer to the fines bin.

The latter provides feed for a briquetting installation. As drawn from the bin, fine material flows into a Komarek-Greaves machine

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Typical Buell gravitational inertial type classifier for "dedusting" crushed limestone for glass industry.

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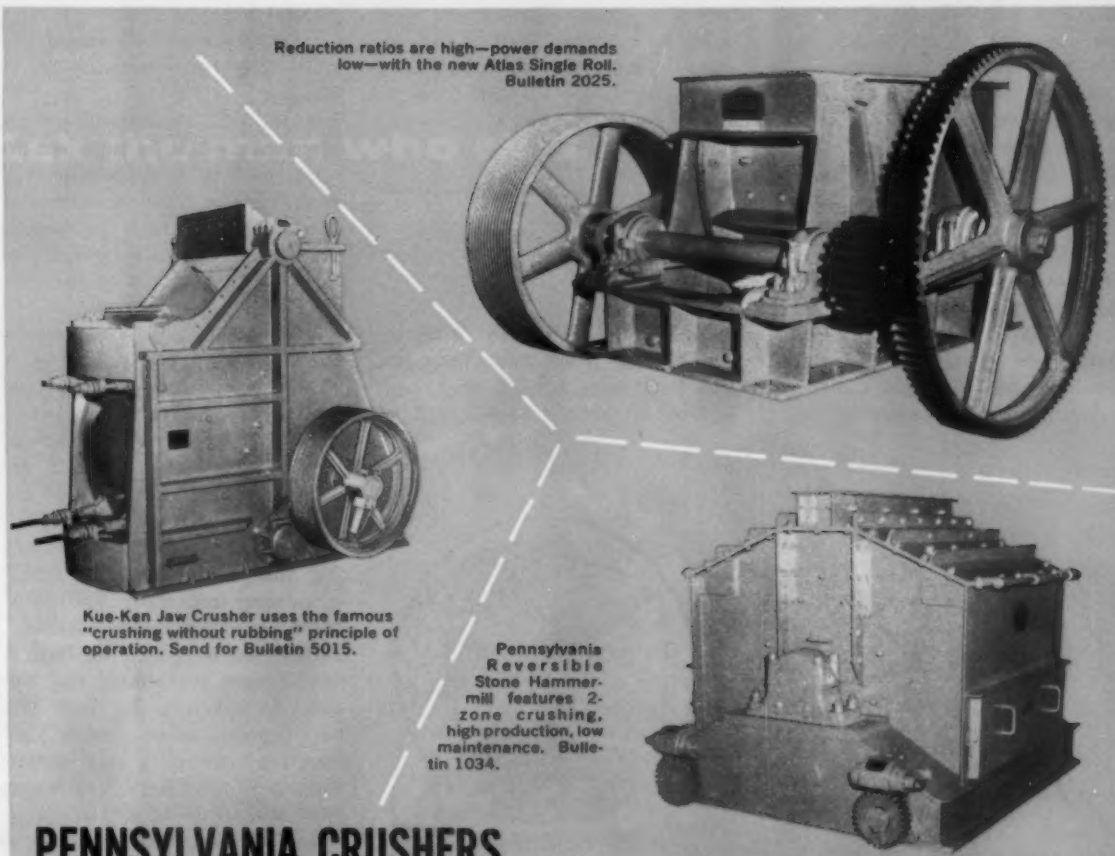

Reduction ratios are high—power demands low—with the new Atlas Single Roll. Bulletin 2025.

Kue-Ken Jaw Crusher uses the famous "crushing without rubbing" principle of operation. Send for Bulletin 5015.

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will handle all your primary and secondary crushing jobs for agricultural limestone

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Kue-Ken Jaw Crushers, with famous "crushing without rubbing" principle (sizes up to 48″ x 60″)—or new Atlas, Hercules or Penn-Lehigh Single Roll Crushers meet all primary requirements. Capacities up to 1200 TPH; feeds up to 32 inches.

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Pennsylvania Crushers are rugged "Bath-built" construction, combining latest improvements in design and operation.

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which forms the briquets. These are then conveyed to the bucket elevator and raised to the screens.

Sized fines-free products from the vibrating conveyor are transported by belt conveyor, equipped with a belt scale, to the rail- and truck-loading point, a swivel chute is provided for loading either type of transport.

In this new installation Cuyahoga Lime has met the primary objectives of the industry's producers—production efficiency; operating economy; and most particularly, product quality. Coupled with these factors are a production site adjacent to a primary market, and capacity to keep that market supplied. The operation's 12-man crew is headed by C. W. Herold, plant superintendent.

Agstone Promotion

(*Concluded from page* 116)

based on up-to-date lists of farmers obtained from the county offices have been helpful when tied in with a sign-up period and a planned personal follow-up.

7. We vary our advertising literature from the technical to the amusing.

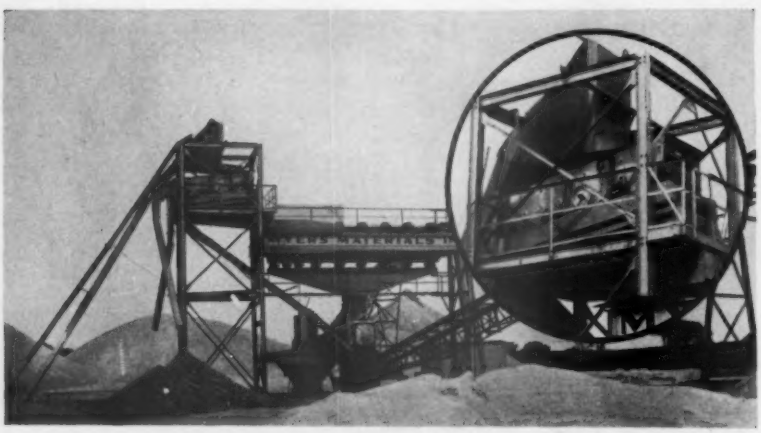
8. We work closely with fertilizer companies which, in turn, are providing more push to limestone sales in the field in order to increase the effectiveness of their product, as well as to counteract the high acidity of the newer types of acid-based commercial fertilizers.

9. We try to educate ourselves and our sales representatives by keeping in extremely close touch with the agronomy departments of local universities on new developments in the broad field of agriculture. We set up seminars conducted by these agronomists for both our sales and office personnel. We find these meetings extremely stimulating technically; and, in addition we obtain much valuable . . . information on which we base future letters, pamphlets, and sales aids. As a result, our sales pitch has become more specific and, therefore, our sales representative and our product have both become more helpful to the consumer.

10. We have learned to sell on a constructive basis—not on a price basis alone. In 1960 we had a competitive price war in a vital part of our marketing area. Needless to say, prices declined sharply, and tonnage also was off slightly, primarily, I think, because of negative selling. In the rest of our marketing area our prices advanced to a point approximately 20 percent (on a delivered price basis) over that of our nearest competition, and our tonnage increased considerably.

In conclusion, we are striving successfully to build up pride in this product of ours called limestone by fostering research, attempting to sell on a constructive and quality basis, and offering a sound agronomic service to the farmer. Despite occasional interruptions and delays, we are achieving proper incentive mark-ups for dealers and wholesalers and a high salary level based on commissions for our salesmen.

I have answered my question. We *do* consider limestone worth promoting, and we propose to continue on a basis which will reflect increasing profits to the plant.



4'x12' KOLMAN Triple-Deck Screen Handles 120 Tons an Hour

Making specification aggregate in Southern Kansas calls for screening large volumes of fine material. When Mr. George Myers of Myers Materials, Inc. installed his new washing plant at Arkansas City, Kansas to produce concrete sand, engine sand and mason sand, his operation demanded a vibrating screen capable of handling fines effectively. His choice — a Model TC-120-48 KOLMAN Triple Deck Screen 12' long x 48" wide.

This high speed, vigorous action screen has proved itself fully capable of the rugged assignment. It receives material from the 8" pump at an average rate of 120-130 TPH. Everything under 2" hits the ¾" square opening screen cloth on the top deck, where less than 5% of the feed is removed. For certain specifications, a No. 4 screen is used on the middle deck.

But frequently the center screen is not used, and the full load of minus ¾" goes directly to the 6 mesh oblong opening bottom screen. Here 40% to 50% of the 120-130 TPH feed must pass, with a very minimum of carryover. Ralph Bridges, Plant Manager and John Bucher, Plant Superintendent, report that their KOLMAN Screen takes care of this separation beautifully. With slots running crosswise, the rapid, sharp stroke of the KOLMAN eliminates blinding on the 6 mesh screen in spite of the great amount of oversize on the deck and even in the most difficult areas of the pit.

KOLMAN Screens are designed for a wide variety of applications, including the toughest washing and crushing jobs as well as the light weight portable plant installations. Your KOLMAN dealer will be glad to provide you with complete data and the names of owners in your locality.

Type TC 4'x12'

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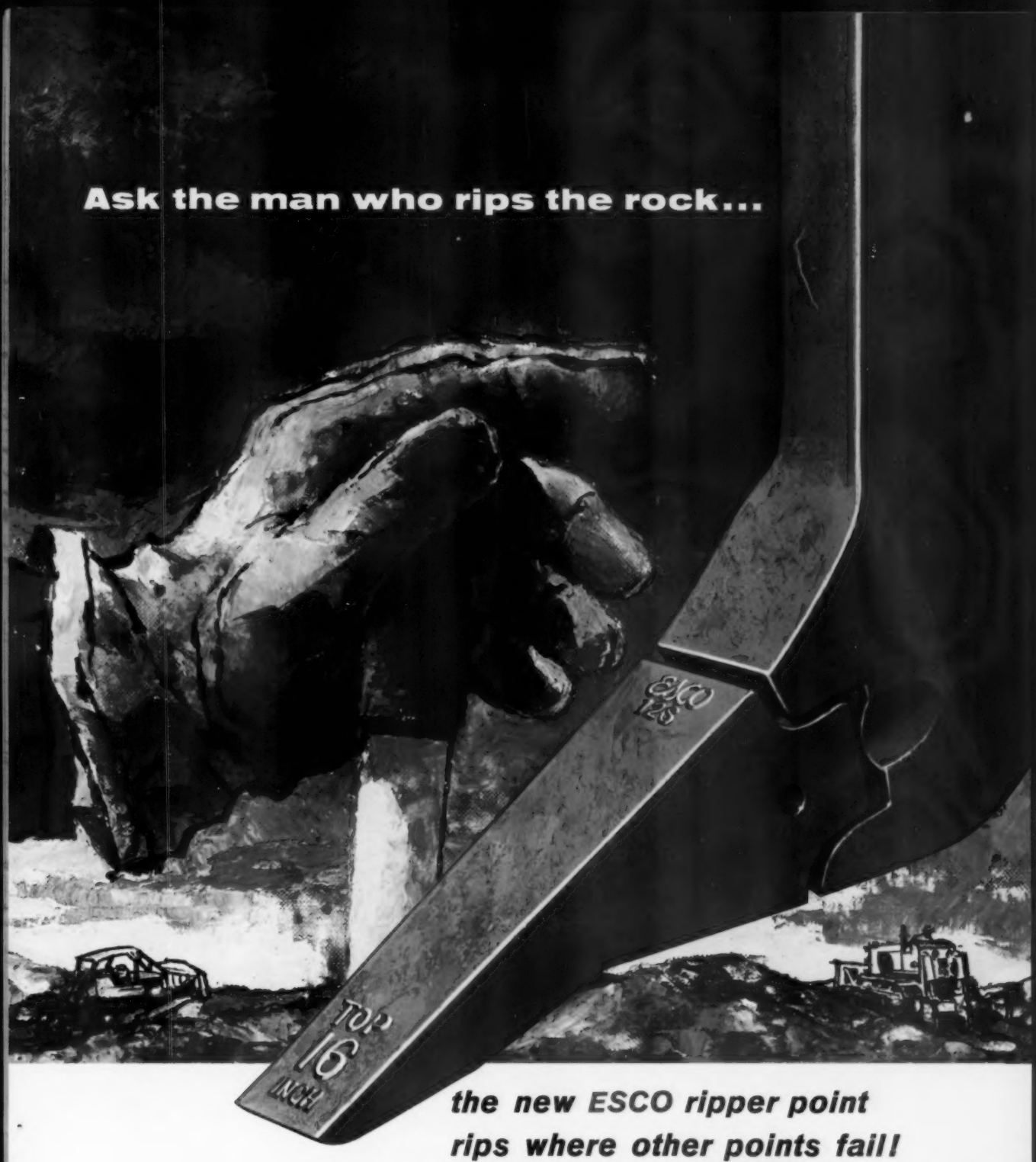

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See other side for more details

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- 16" for tough production ripping.
- 18" for general ripping.
- 20" for easily ripped material.

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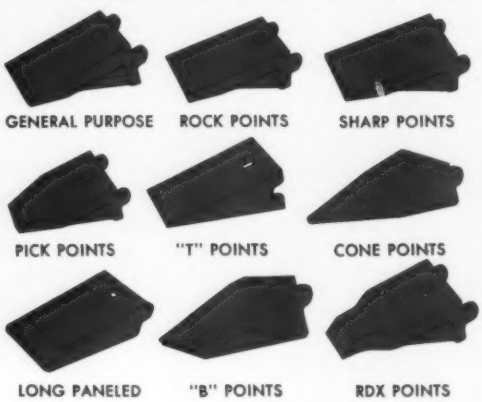
	Job No. 1	Job No. 2	Job No. 3	Job No. 4
ESCO Ripper Points	5½ hours	16 hours	4 hours	56 hours
Other Ripper Points (average)	½ hour	2 hours	1½ hours	8 hours

Longer life, superior penetration, increased production—these are the three features of *ESCO*'s new ripper point that mean lower costs for you. You can easily convert all your rippers to *ESCO* points. Ask your local *ESCO* dealer about cast *ESCO* shanks and *ESCO* weld-on nose pieces to convert any shank.

9 POINT TYPES FOR EVERY DIGGING CONDITION



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ESCO's wear cap adapter is the most rugged tooth assembly ever developed.

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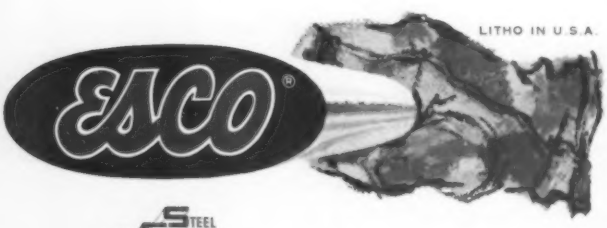

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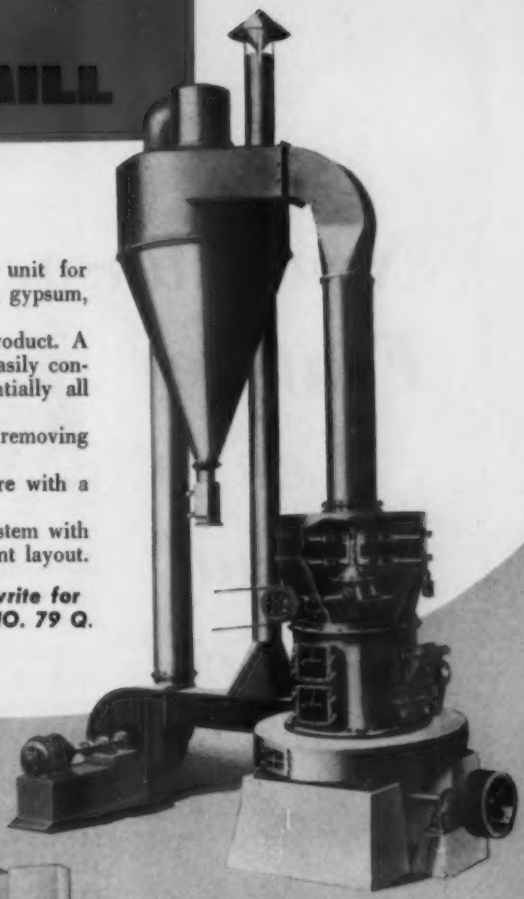
with WHIZZER AIR SEPARATOR
either SINGLE or DOUBLE TYPE



This modern combination offers a versatile and economical unit for handling the problems involved in the preparation of limestone, gypsum, clay and other non-metallic minerals.

The Whizzer feature improves capacity and uniformity of product. A single adjustment of the speed of the revolving Whizzer Blades, easily controls the fineness range from 20-mesh grades to products essentially all minus 325-mesh.

The Mill can be equipped with Flash Drying Accessories for removing surface moisture while pulverizing.

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All operations are combined in a clean, dust-free, automatic system with a flexibility of installation that can be readily adapted to any plant layout.

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The principle of incorporating a revolving bowl and stationary grinding rolls, with no metal-to-metal contact, provides wide range capacity at continuous 24 hour, noiseless, vibrationless operation. Availability is almost 100 per cent.

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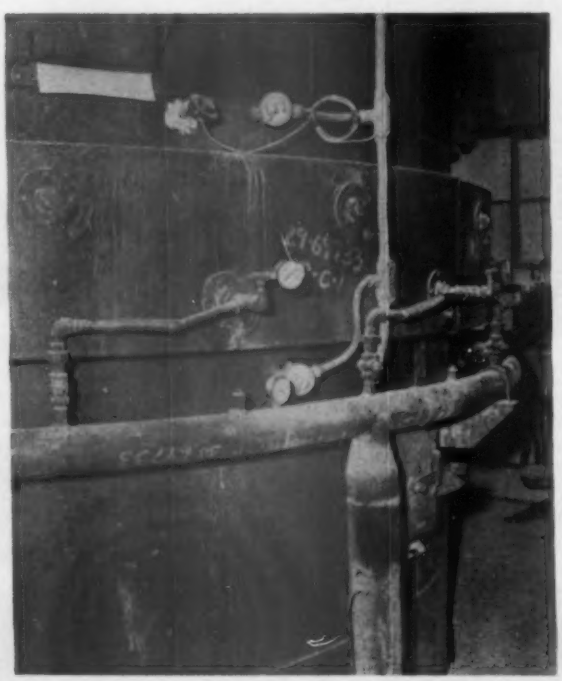
New Kansas Lime Plant Features Center Shaft Vertical Kiln

By WALTER E. TRAUFFER

ONE of the latest additions to the lime industry in this country is the Midwest Lime Company, Inc., of Bonner Springs, Kans., which recently put into operation a new vertical kiln plant. Built and operated by men with no previous lime burning experience, the basic design of this operation was developed after a thorough study had been made of other plants throughout the country.

The contract for designing and building the plant was then awarded to the Basic Industries Division of McNally-Pittsburg Company of Pittsburg, Kans., which has had wide experience in burning of various kinds, but not in the lime industry. This combination of factors resulted in an unusual design of kiln which is already approaching its designed capacity and promises excellent fuel economy. The plant is successfully processing a relatively small-sized limestone (3- by 1½-in.) that heretofore has usually been considered too difficult to calcine in a vertical kiln because of the comparatively small percentage of void area for gas flow. Other unusual features of this operation make it of special interest. Plans allow for later addition of kilns, a hydrating department, etc.



This view on the firing floor shows the gas line and the manifold, with connections to the burners inside the air manifold above. At the right are two of the eight thermocouples which record temperatures.

High-calcium limestone for this plant comes from the mine of Loring Quarries, Inc., which has for many years been a major producer of crushed stone in this area. In investigating minerals deposits all over the state in order to help develop Kansas industry, the Geological Survey of Kansas (a division of the University of Kansas) discovered that a ledge in this deposit not previously worked was suitable for lime manufacture. For some years the Loring firm has been working a 35- to 40-ft. ledge of Argentine limestone for crushed stone only. Above this is a 1-ft. ledge of shale. Next is a 4- to 6-ft. ledge of lower Farley limestone, with about 1 ft. of shale between it and a 22- to 24-ft. ledge of upper Farley limestone. This upper Farley is the one now being worked for lime manufacture. Above it are several thick ledges of Plattsburg limestone. The Farley limestone will run 97 to 98 percent total carbonate.

The lower level deposit had been quarried for ballast by the Union Pacific Railway but was abandoned during World War I. In 1938 Guy Stanley Jr. formed the firm of Loring Quarries, Inc., and reopened the quarry to supply the railroad with riprap and ballast; and later commercial crushed stone was added.

In 1947 the development of the underground mine was begun. In 1951 a separate firm—the Natural Storage Company—was formed to

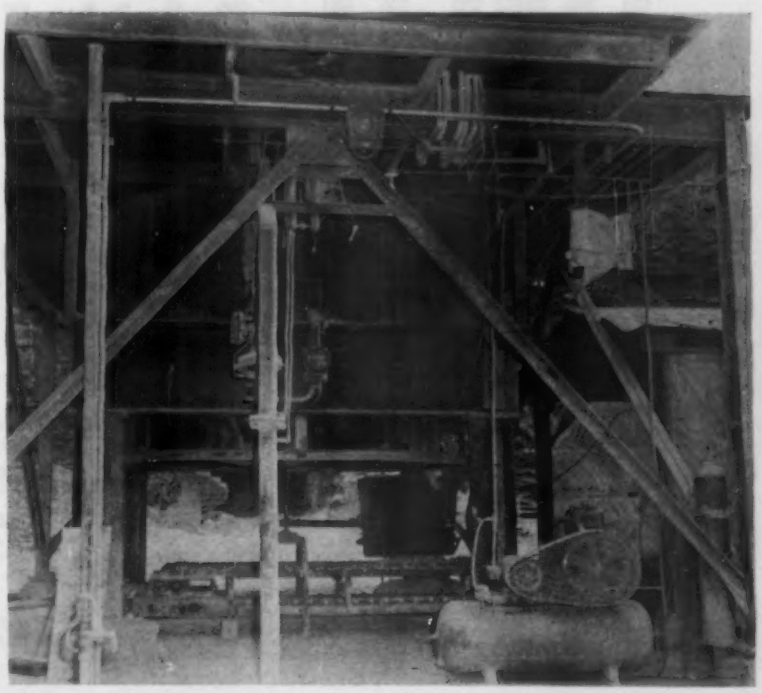
A general view of the Midwest Lime plant with the crusher, screen, and feed bin at left. The draft pan is shown on the kiln, and the quicklime elevator and bins are at the right.

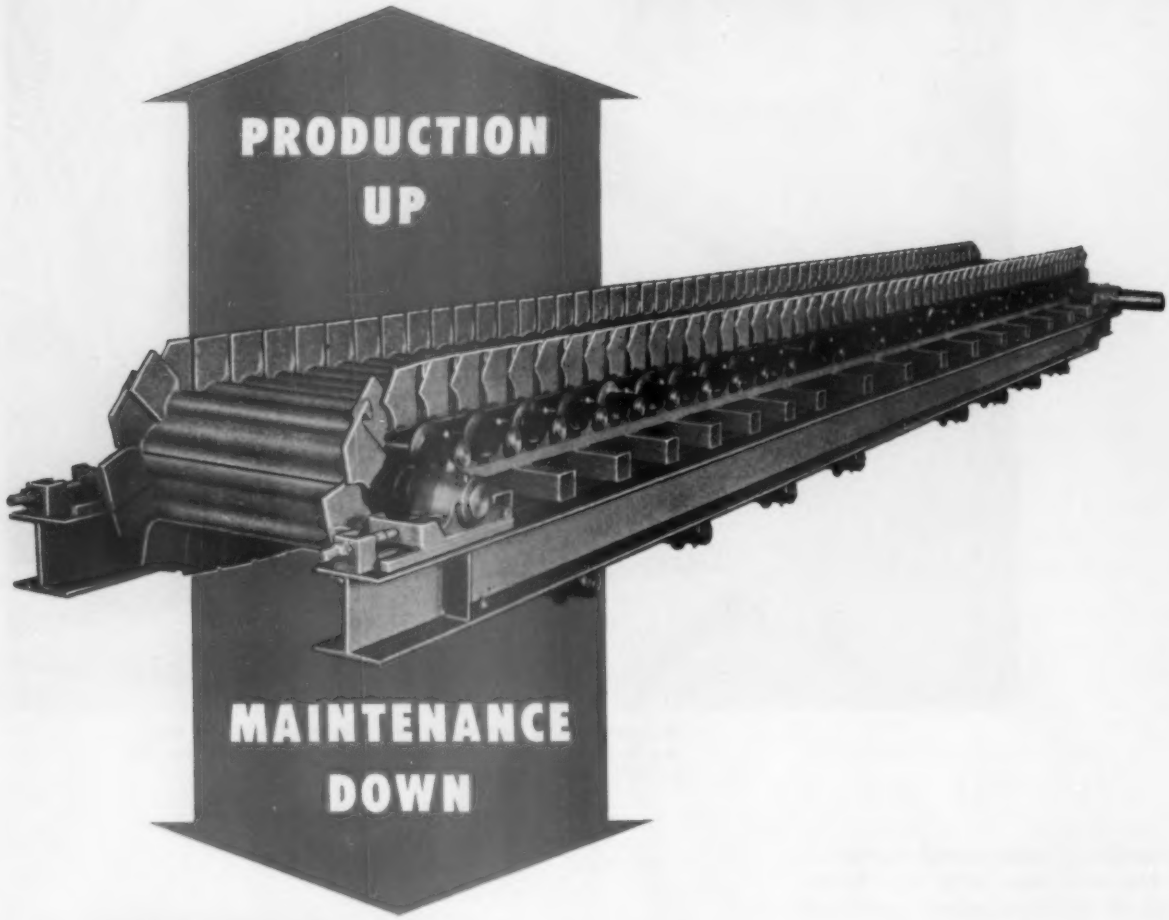
develop an underground warehouse. This area now takes up 800,000 sq. ft. of the mined-out area, and there is another 2,000,000 sq. ft. available if needed. Products stored here include frozen and fresh foods, eggs, resins, plastics, candy, etc. The space is bought outright by the storage company and leased to various users.

Early in 1960 another separate company—the Mid-Continent Quarries Co.—was formed to operate a lime plant. This name was later changed to the Midwest Lime Company. The new lime plant went into experimental operation in September, 1960, but full-scale production did not start until February, 1961. Excellent progress has since been made in ironing out the problems found in any new operation. The limestone used in this plant is purchased from the Loring firm.

The latter uses standard air drill mining procedures in quarrying stone and lime. A Michigan 375 front-end loader and four LeTourneau-Westinghouse D18 Tournarockers are used. The haul is nearly a mile within the mine to the 250-t.p.h.

The bottom of the kiln, with a pivoted bucket which draws as desired from the radial gates onto the apron conveyor.





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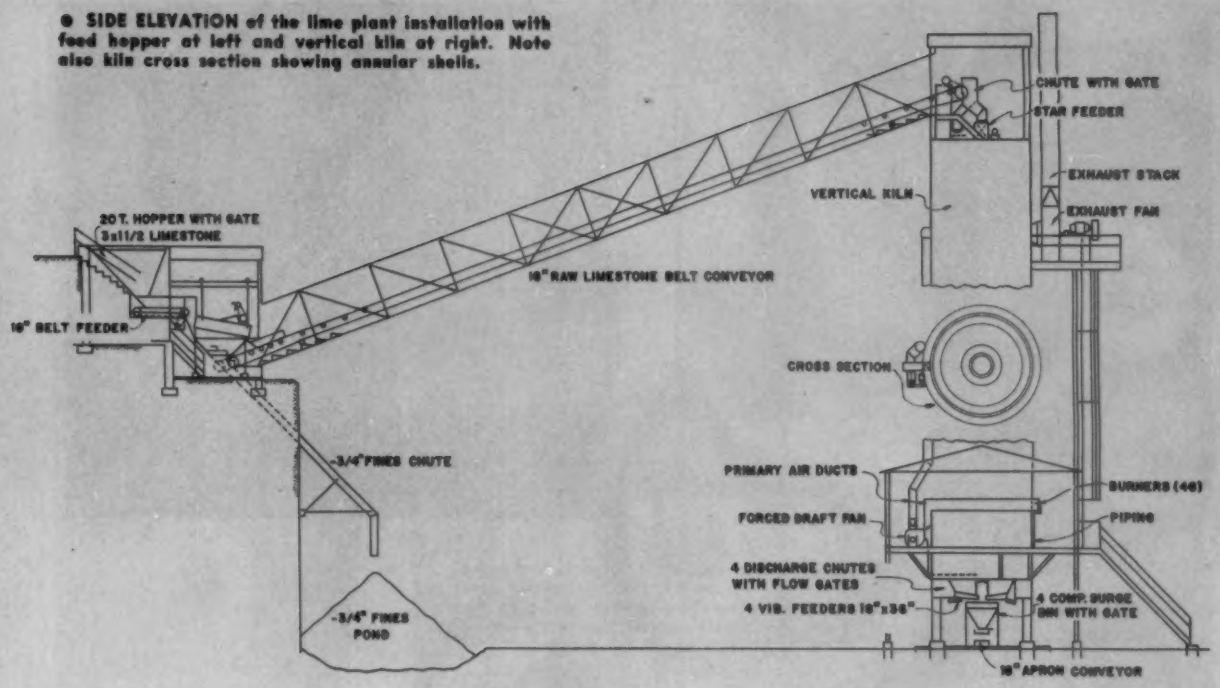
● SIDE ELEVATION of the lime plant installation with feed hopper at left and vertical kiln at right. Note also kiln cross section showing annular shells.



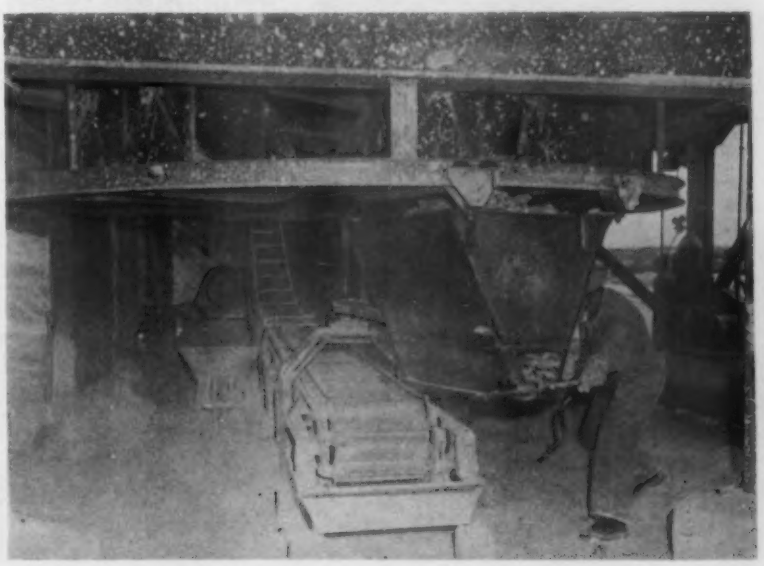
plant outside, where the stone is crushed and screened to size. A ramp leads from the lower Argentine (crushed stone) rock level in the mine to the higher level, where the Farley (lime) rock is mined. Each rock is mined and processed separately. Some is stored in the mine to be used as needed.

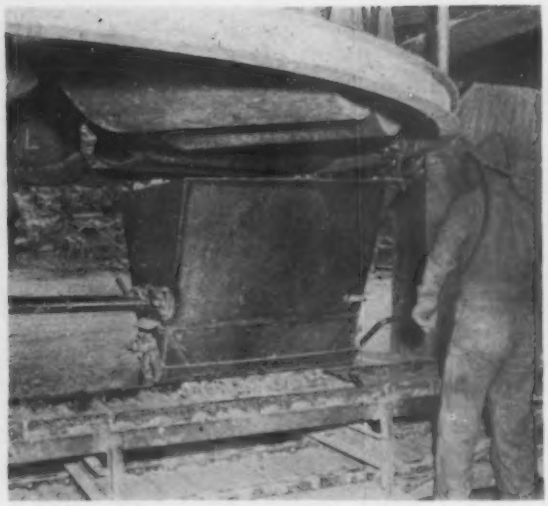
The 1½- to 3-in. lime rock is hauled about ½ mile from storage to a stockpile at the top of an old quarry face below which the lime plant is located. A Michigan front-end loader is used to feed the stone as needed into the 30-ton lime plant hopper. A belt conveyor feeds to a vibrating screen which washes and removes anything under 1¼ in. Another conveyor feeds the stone to a small hopper, under which is a 4-bladed star feeder which feeds through an opening in the kiln hood.

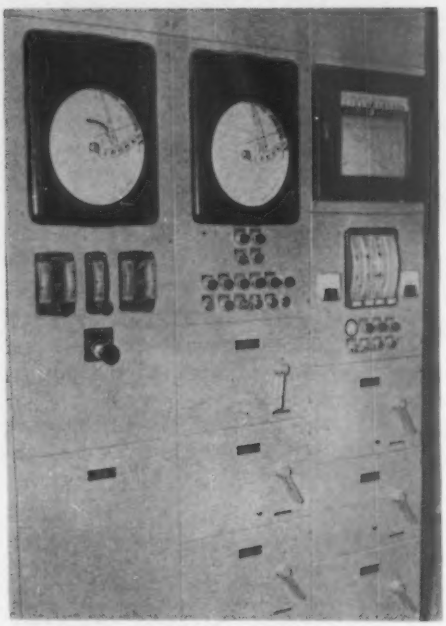
The feeder has an original design which prevents jamming of the rock and yet prevents air leakage. To maintain an air seal, each of the four blades is tipped with bolted-on strips of neoprene rubber. The cylindrical chamber in which the blades revolve is formed by a cylindrical segment at each side, one of which is hinged at the top to allow any protruding rock to push the segment aside and pass. Counterweights keep adequate pressure between the movable segments and the blades. The stone is discharged into the top 15-ft. pre-heating and storage section of the kiln. Upper and lower level Bin-Dicators in this section automatically start and stop the flow of stone to the kiln as needed.

The kiln—of McNally-Pittsburg design—is unique in that it is dough-

Loading the bucket under one of gates. When the bucket is full, it is swung around to discharge on the conveyor.







Top, left: Material discharging from the 13-cu. ft. bucket onto the pan conveyor going to the crusher. Note the construction of the drawoff gates above.

Top, right: Quicklime being discharged from the pan conveyor to roll crusher before going via elevator to bins.

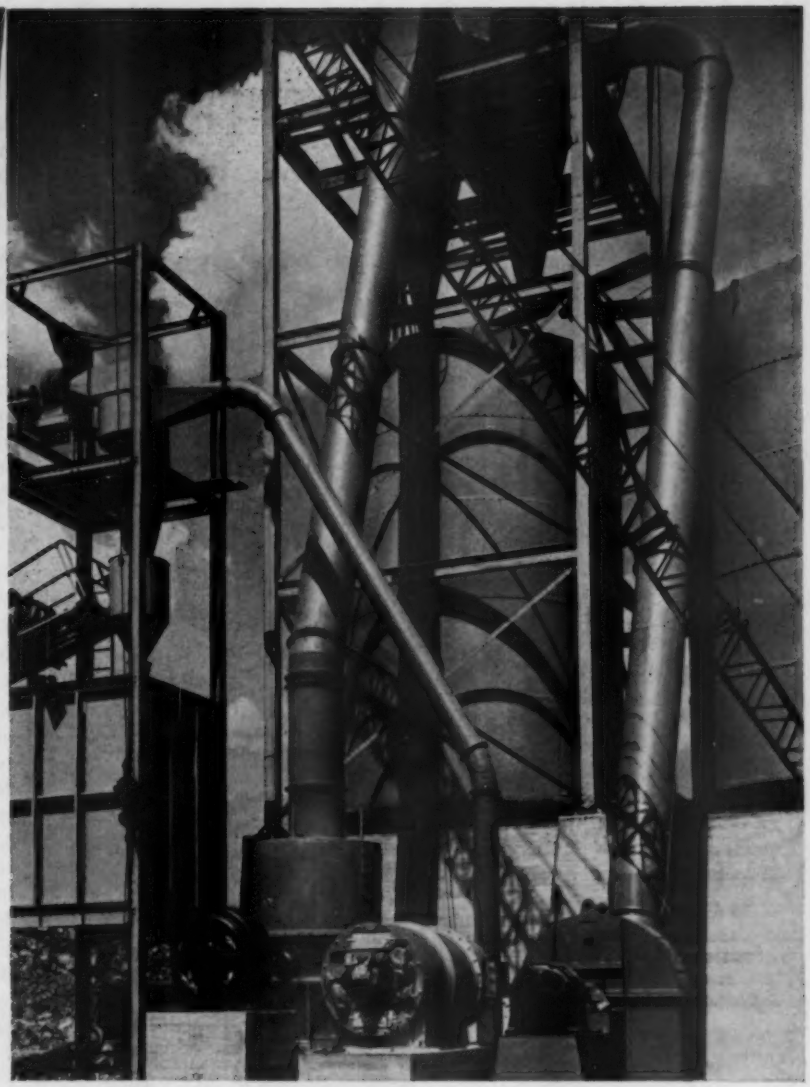
Left: The kiln control board, with the oxygen and combustible analyzer, temperature recorder, various flow meters, etc.

Below: A view of the mine openings, with a part of the crushed stone plant at the left. Openings with doors lead to the refrigerated storage areas.

nut shaped in cross-section, with a center air-cooled vertical shaft, and does not have a necked-in calcining area. The kiln shell is 57 ft. 6 in. high and has straight vertical sides. With its 13-in. refractory lining it is 11 ft. in interior diameter.

The center shaft extends the full height of the kiln and, with its 13-in. refractory has an outside diameter of 5 ft. It also has straight vertical sides. This leaves a clear 3-ft. wide circular or 75 sq. ft. cross-sectional calcining area. Both the shell and the center core are lined with Harbison-Walker refractories. In the 3-ft. burning zone area 70 percent alumina brick is used. Above this is 12 ft. of Alamo abrasion-resistant brick. Ordinary firebrick is used elsewhere.

Firing is done with natural gas from Kansas fields, averaging 950 B.t.u. per cu. ft. There are 48 burners, 32 in two rows around the kiln outer shell and 16 in two rows around the inner shaft, all at a point 32 ft. 6 in. below the bottom of the kiln storage section. As operations progressed, fewer burners were required, until now only half of them are used—16 in the outer perimeter and 8 protruding from the center shaft. The others can be cut back in if and when needed. The center column is kept cool by a



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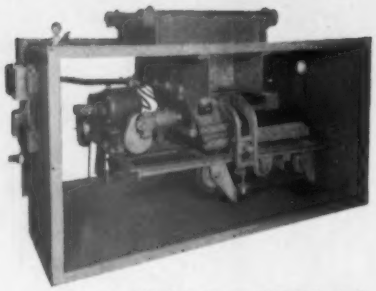
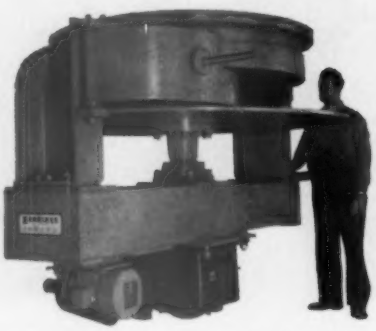
For the Hardinge Feeder story, with drawings, photos and detailed specifications, ask for 12-page bulletin No. 33-F-8.



A Hardinge Constant-Weight Feeder® mounted in a dust housing, with side covers removed. Observation windows are provided in covers. Note track-mounting wheels at top.



84-inch diameter Hardinge Disc Feeder for installation in a lime and cement plant.

Extra-long (96 inch) conveyor type Hardinge Volumetric Belt Feeder designed for bin mounting.

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blower, located on top of the kiln, which sucks air in from the bottom of the column.

The burners are also original in design, the nozzles consisting of ¾-in.-diameter chrome nickel high-temperature steel bars through which ¼-in. holes have been bored lengthwise. These are connected by ¾-in. I.D. pipe to the 3½-in. gas manifold around the kiln and a manifold inside the column. This arrangement provides the pressure necessary for adequate projection of the flame into the kiln. The burner openings are created by blocks made from Harbison-Walker high-temperature castable, and the gas nozzles extend to within 2 in. from the surface of the refractory lining.

There is an air manifold around the ring of burners outside the kiln shell and a ring inside the center shaft. Air is admitted through the manifold into the kiln through gas portholes at each opening by means of metal discs with holes, built inside the manifold. These discs can be turned from the outside to predetermined settings to control the primary air input at any desired rate.

Primary air introduced at the burners is partly mixed with CO_2 from the top of the kiln. A 50-hp.,22,000-c.f.m. Buffalo fan draws air from the kiln through an arrangement of four radial steel pipes at the bottom of the kiln storage section. Each of these pipes has eight 4-in. holes in the bottom and on the sides below the center, with ¾-in. mesh wire covers to keep out rock. Three of these pipes (13 in. I.D.) feed through to the fourth (26 in. I.D.), which is connected to the fan. About 10 percent of the gas flow is returned to the burners. The primary air is supplied by a 3-hp., 2,340 c.f.m. Buffalo Forge fan. Secondary air is introduced through the draw gates in the bottom of the kiln.

Kiln control is from an Allen-Bradley board with Bailey instruments, including an oxygen and combustibles analyzer; stack temperature, exhaust air flow, gas pressure, and flow meters; a Minneapolis-Honeywell (Brown) temperature recorder on which 8 points are being used; ammeters; etc. Temperatures are obtained at 7 points in a row up the side of the kiln and

one at the top of the center column, through thermocouples. These are protected from direct heat by flanges of heat-resisting metal with which they are in contact. There is some heat loss and transmission, but this is estimated and allowed for. The actual calcining temperature in the hot zone is 2,300 to 2,350 deg. F. When operations are stabilized at the designed level, it is planned to install automatic controls for the gas flow and exhaust air.

This kiln is designed for an ultimate capacity of 100 tons per 24-hr. day. It started up with an output of 60 tons in 24 hr. and has now reached 75 tons. It is believed that, as various bottlenecks and other problems are evened out, it will reach and perhaps exceed the rated capacity. Even at the present output, fuel consumption is only 4,500,000 B.t.u. per ton. This and the almost complete absence of core, is attributed to the small size of stone used.

The kiln is drawn through 12 openings in the bottom, arranged radially in pairs; each is equipped with a clamshell gate. These are now operated manually but will be equipped with air cylinders. Discharge is into a 13-cu. ft. hopper mounted to a bar pivoted from the center of the kiln, so that it can be swung manually to any drawoff opening to be filled and then to a position from which it can be discharged through a clamshell gate to the drawoff apron conveyor. Gates are now drawn at 6 min. intervals in a sequence—Nos. 1, 6, 3, 8, 5, 10, etc. —creating a sort of walk-down movement of the material in the kiln.

The McNally apron conveyor is 18 in. wide and is horizontal for 26 ft., leaving room for a second kiln over it. It inclines to discharge into an 18- by 18-in. McNally single roll toothed crusher. This unit can crush to any desired size from 3-in.

(*Concluded on page* 146)

AIR HEAT ECONOMY
FOR LIMESTONE AND ROCK INDUSTRY

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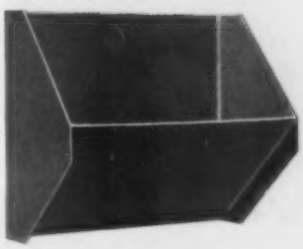
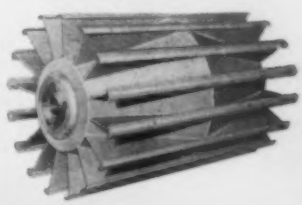


Continuous Elevator Bucket Style No. 2. Styles include Salem, Style "A" and other continuous style buckets.



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Missouri producer offers complete plant nutrient program to farmers

• Tighter agstone specs changed production picture

By WALTER E. TRAUFFER

ANOTHER ON THE SPOT report

COMPLETE service for soil improvement is the motto of the Williams family of Clinton, Mo., which supplies farmers with agstone, phosphate, potash, and other fertilizers to meet their needs. Road stone and crushed stone are also produced, and a recent venture is asphalt paving construction.

This all began in 1935, when I. L. Williams Sr. and his oldest son Cyril, started up a crushed stone business near Clinton, with some incidental agstone as a sideline. Clinton is a county seat 65 miles southeast of Kansas City, Mo., in the heart of a prosperous farming area. Two other sons, I. L. Williams Jr. and B. I. Williams, came into the business in 1938 and 1946, respectively.

Because of the growing demand for agstone, facilities for added production were installed in 1943 and again in 1958. Except for 30 months spent by I. L. Williams Jr. in the Air Force in the Pacific theater from 1944 to 1946, all four have been active in this business ever since.

Then in 1958 came the new Missouri agstone specifications, with requirements for increased fineness and penalties for excessive magnesium content. As a result, it was decided by the Williamses to concentrate all agstone production at one plant which has high-calcium rock, and to produce only road and crush-

A general view of the plant, showing the permanent screening and storage department at the left. In the center is the agstone reduction crusher, with screen and bins at the right.

In this view of the Williams plant, a truck is dumping rock to the portable primary crushing and reduction crushing sections of the plant.

ed stone at the other locations. Two separate corporations were formed, the Williams Rock Mining Co. to produce agstone, concrete aggregates, and some road stone; and the Williams Rock Company, to produce road stone and also to warehouse various fertilizers.

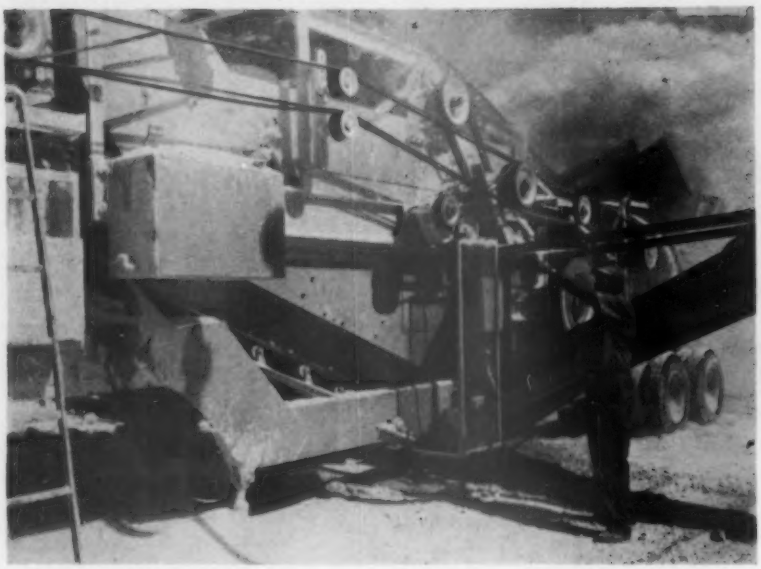
Some of the other quarry companies in that part of the state also operated in the harder, lower-calcium rock and found it unprofitable to continue agstone production under the new specifications. As a result, the Williams firm's agstone sales nearly doubled in 1958, to 44,000 tons, then went up to 55,000 tons in 1959; volume dropped off to 42,000 tons in 1960.

The old agstone specifications required grinding to a fineness of 90 percent through 8-mesh. Now the basic requirement is 50 percent through 40-mesh, with a proportionate amount through 100-mesh and 95 percent through 8-mesh. This is said to be about as fine as the ordinary hammermill will grind without drastically cutting down capacity. This is the desired gradation, but actually payment is based on the percentage through 40-mesh. Anything under 50 percent brings down the pounds of effective calcium and the amount paid, but there is no extra pay for over 50 percent.

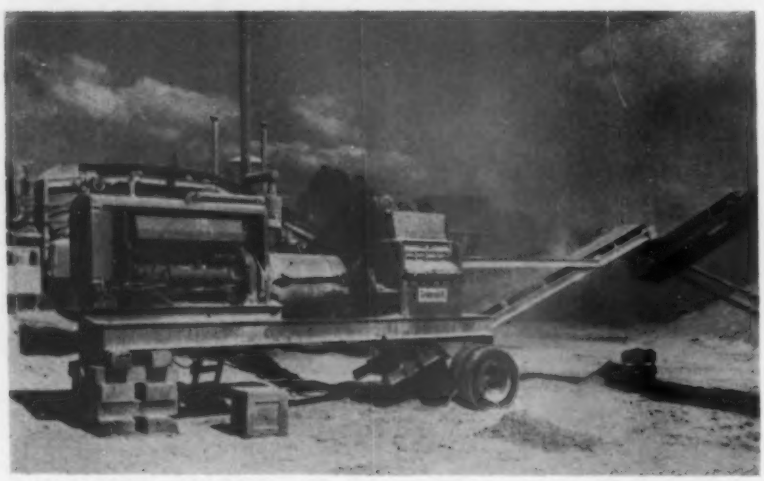
The agstone from this plant is guaranteed 90 to 94 percent $CaCO_3$, and at 50 percent the guaranteed analysis is 368 lb. of effective cal-

Bill Parker, left, going over a purchase order for delivery of agstone with I. L. Williams Jr., president.

This down-under shot in the mine shows the ¾-cu. yd. front-end loader loading to one of three dump trucks.



I. L. Williams Jr., president of the firm, pointing at the double-deck screen which makes the first separation.



A close-up of the portable secondary hammermill, which makes the third reduction for agstone production.

A close-up of the portable screening plant and storage bins for agstone and one size of rock.

cium per ton. There is no guarantee on MgO, but this runs between 0 and 0.56 percent. Actually the soil in this area needs no magnesium.

At one time the company owned its own spreaders, having bought the first one in 1937. The first truck spreader was bought in 1940, and the number was in increased to a dozen later on. In 1956-57 all of these units were sold to the independent contract haulers who now deliver and spread for the company. In a few cases a farmer has bought his own spreader and then started to haul and spread for others also. The increased agstone business has enlarged the marketing area to seven counties, and direct hauls are made as far as 30 to 35 miles. Sales are also made through four elevator operators, acting as vendors, to points as far away as 60 miles. These vendors are in the fertilizer business, and to some of them the company also wholesales aggregates.

Beginning in March of this year, the company expanded its service to farmers by employing a full-time salesman for its products, who also works with the farmers on their fertility programs. He takes soil samples from the farms to the soil laboratory for testing, at no cost to the farmer. If the soil test shows that calcium, phosphate, or mixed fertilizers is needed, he again contacts the farmer and uses the report as a sales argument. In the short time this program has been in effect, the results have been very satisfactory.

The plant producing agstone, along with concrete aggregates and some road stone, is located 7 miles southeast of Clinton. The deposit being worked is an 87-ft. ledge of the Burlington limestone formation. This is being worked by room-and-pillar mining, with an inclined road going down from ground level, which is about 65 ft. above. The working level is 35 to 40 ft. below the level of the Grand River, only a few hundred feet away, but the solid rock permits no seepage. The mine was opened by drifting back 14 ft. high and then benching off. From 6 to 7 acres have now been worked out, with an average height of 40 ft., and 12 to 13 acres to a depth of 14 ft., the latter to be

lowered later. At least 30 ft. of solid rock and 35 ft. of clay, flint, etc., are above the workings. Below this formation is some of the Chouteau dolomite, which runs 30 to 35 percent magnesium carbonate. Some of this material could be mined if it were ever needed.

Drilling is done with 3½-in. Joy and Gardner-Denver jib drills mounted on old truck chassis, with air supplied by a Gardner-Denver 600 portable rotary compressor. Drilling patterns are varied to suit conditions. Trojan TL565 non-headache-type explosive is used along with caps, fuse, and Thermalite Type A igniter cord. Loading is done by a Michigan 175 front-end loader with ¾-cu. yd. bucket and a diesel engine. Three dump trucks—two Macks and a Chevrolet—haul the rock the short distance to the plant. The high ceiling keeps the air safe; an air fan and a vent are needed steadily only in warm weather.

It would be impracticable to work this deposit by open quarrying because of the great depth of overburden and because of other factors. According to I. L. Williams, president, mining makes it possible to work around the year. Shots can be made regardless of weather, and the stone is dry. It also makes the highest quality of rock available, as the top rock in this formation has some impurities not found lower down.

At the plant the trucks dump from an earth ramp to the apron feeder of a Cedarapids portable crushing unit. The 25- by 40-in. primary jaw crusher reduces the stone to 5- or 6-in. minus. This stone is conveyed to a Cedarapids portable reduction unit with a 33- by 44-in. hammermill, which reduces to 1-in. minus. At present only one separation is made, on the 1-in. top deck of a 4- by 14-ft. 2-deck vibrating screen.

Plus 1-in. stone over the screen is surfacing rock and goes to trucks for delivery or stockpiling. All of the minus 1-in. stone is now conveyed to the 4- by 12-ft. Seco 3-deck screen over the stationary bin setup. This usually has 5/16-in., 3/16-in., and 8-mesh openings. The products —up to three sizes of crushed stone, and agstone—go to the four 50-ton

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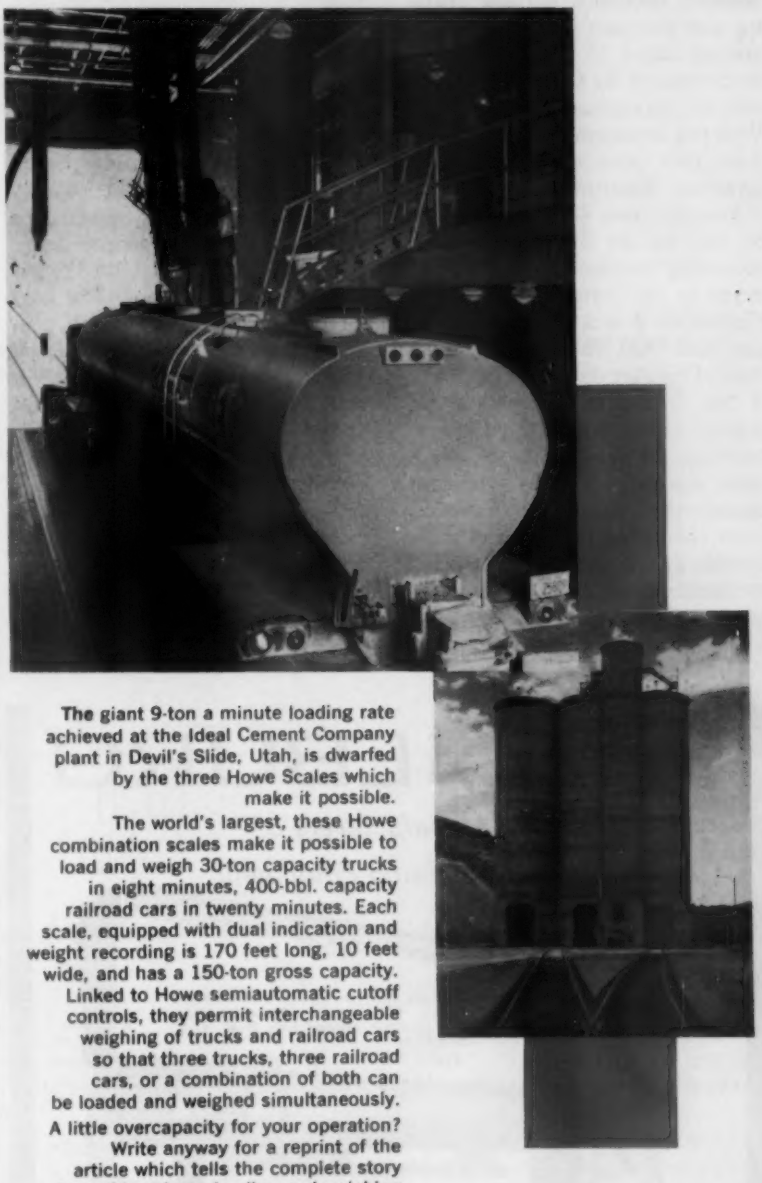

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truck-loading bins. With this arrangement, the plant produces about 100 t.p.h., of which about 25 tons is agstone.

During periods of peak agstone demand, additional portable crushing and screening units are used, to give an added 35 t.p.h. of agstone, for a total of 60 t.p.h., and a total over-all production of 125 t.p.h. With this arrangement, all the minus 1-in. rock goes to the stationary screening department.

Oversize, now 4-in. to 1-in., goes to the 40- by 30-in. Cedarapids secondary hammermill and by conveyor to the portable 4- by 12-ft. Cedarapids 2-deck screen. This unit can have 1-in., ½-in., or any other desired opening on the top deck and it has 8-mesh on the bottom for agstone. The two products go to separate 20-ton bins from which short conveyors load to trucks for shipment or transfer to stockpiles.

In either flow the products made include 1-in. concrete aggregate and surfacing stone, 5/16-in. chat for ready mixed concrete and concrete blocks, and ¼-in. surface stone for the firm's own hot and cold mix asphalt plant. All shipments are weighed on a 40-ton Thurman truck scale.

This plant is entirely independent of utility power. The primary crusher is driven by a 671 GMC diesel engine, the secondary unit by twin 71 Series GMC engines, the second hammermill by a Murphy diesel, and the portable screening unit by a PU82 International diesel. The Seco screen in the permanent screening plant has a small Case l.p. gas engine with its tank at ground level for easy filling.

Officers of the Williams Rock Mining Company are: I. L. Williams Jr., president; Cyril Williams, executive vice-president; B. I. Williams, vice-president in charge of operations; and I. L. Williams Sr., secretary. I. L. Williams Jr. is a member of the board of directors of the Missouri Limestone Producers Assn.

The Williams Rock Co. has the same officers, except that Cyril Williams is president and I. L. Williams Jr. is executive vice-president. This company has a Cedarapids portable crushing and screening plant rated at 80 t.p.h. This unit alternates between two open quarries in the Fort Scott formation of hard limestone, one 12 miles west and the other 11 miles north of Clinton. It produces roadstone only, much of the output being used on haul roads for two large Peabody Coal Company strip mines in the area. Large stockpiles of finished material are kept at both locations. This company also has a warehouse near downtown Clinton for storing and handling rock phosphate, bag and bulk fertilizers, straight nitrogen, potash, etc., and blends to any analysis.

The Williams Paving Co. is a partnership of the above four men formed late in 1960. It operates a White portable asphalt plant with a capacity of 25 t.p.h. on hot mix and 50 t.p.h. on cold mix. This company does its own paving with equipment including rollers, graders, etc.

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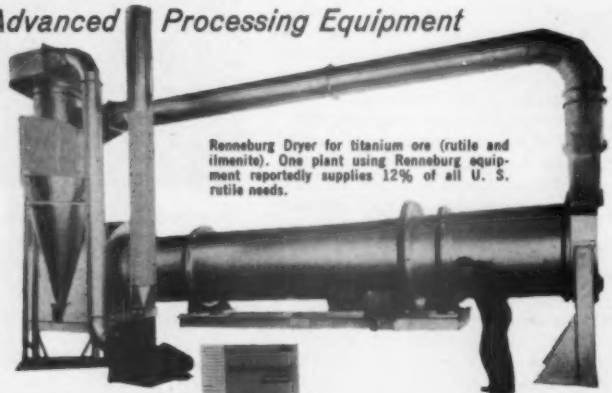

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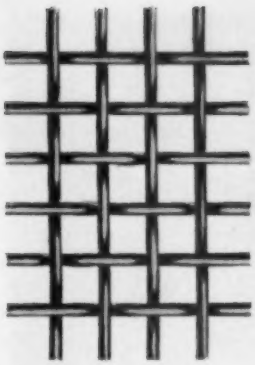
Midwest Lime Company

(*Concluded from page* 141)

to 1-in. minus. A bucket elevator feeds to a revolving screen with ¼-, ½-, and 1-in. openings. The four sizes are discharged into the four 30-ton compartments of a steel bin. At present all shipments are hauled in trucks. There are two gates under each bin. One row of bins will eventually feed to a loading system for cars and trucks, and the other to a hydrating department.

Deliveries are now being made by a Diamond T diesel tractor and two Fruehauf lime tank trailers. Both units haul 18-ton loads. Most of the output is now going to fill a contract with Kansas City, Mo., for water treatment, but the regular commercial market is also being developed.

Officers of the Midwest Lime Co., Inc., are: Robert O. Stanley, president, and Joseph McDowell, secretary. Donald Cochran is plant-superintendent.



Have You Considered Heated Screen Decks To Prevent Blinding?

Operators of limestone crushing and screening plants are often faced with the decision of whether or not to install heated decks on screens making separations from ⅜-in. down to and including 8-mesh. The need to make this decision is motivated by two reasons: to prevent blinding; and to improve production specifications. The following article, which describes different types of heating units, may help you in making a decision.

By S. C. WESTERFELD
Processing Machinery Dept.
Allis-Chalmers Mfg. Co.

IT is well known that improved specification stone will bring a premium price. And as specifications for agricultural limestone become more exacting, the need for heated screen decks increases. There are many types of heating units available. These vary from the simple economy installation—with limited flexibility and current-carrying capacity—to the premium unit which, with its greater flexibility and high current-carrying capacity, permits operations under the most severe conditions. All types operate under the same principle: resistance heating of wire cloth using single-phase alternating current.

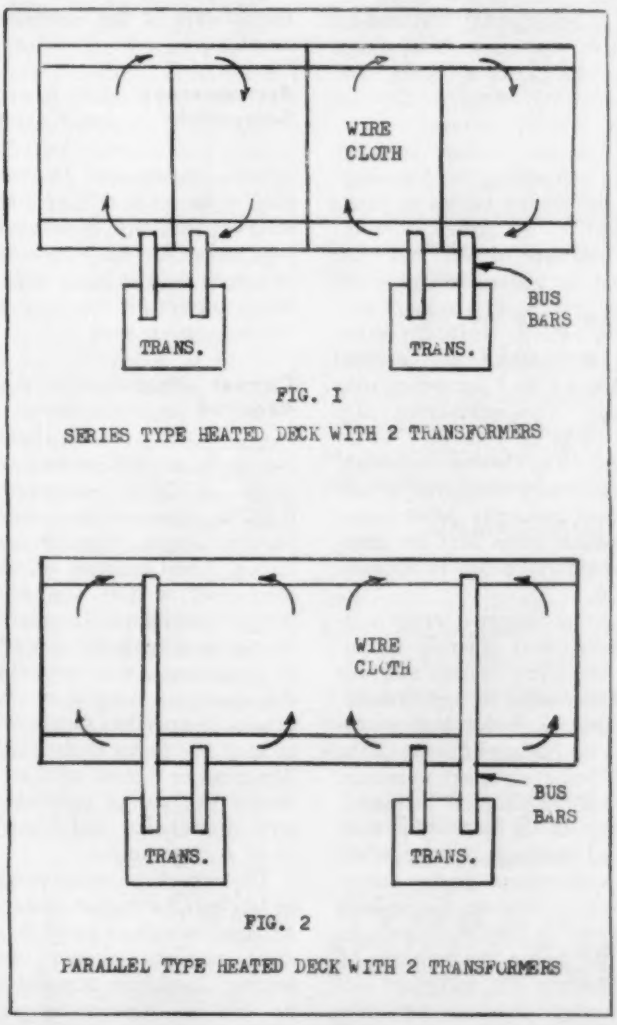


FIG. 1

SERIES TYPE HEATED DECK WITH 2 TRANSFORMERS

FIG. 2

PARALLEL TYPE HEATED DECK WITH 2 TRANSFORMERS

Heating Unit Components Essentially, the electric heating unit consists of the following parts: at least one transformer to reduce power line voltage to a value low enough for personnel safety; conductors, either copper or aluminum, to transmit this secondary current from the transformer to the screen surface; and insulators to prevent the current from heating the screen body itself. As the transformer is stationary and the screen vibrates, the connection between the two must be braided copper flexible leads or laminated sheets of aluminum, or by a large air gap in the transformer itself, which will permit the secondary

bus bar to move within the transformer core.

Connecting in Series or Parallel The low-voltage secondary circuit of a heated deck may be either parallel or in series. Figure 1 illustrates the series type of heated deck with two transformers. The series type of connection requires wire cloth sections in pairs. In other words, the screen must be divided into 2, 4, 6, etc., sections of wire cloth.

The advantage of the series connection is that it uses higher secondary voltages. Therefore, less copper is required for the secondary circuit. As can be seen in Figure 1, the current travels across the width of the screen and then back. For example, on a 4-ft. wide screen, the effective width of the screen in a series connection is 8 ft. The disadvantage of the series type of connection is that the screen itself must have wire cloth sections originally designed in pairs; otherwise, structural modifications must be made to the body.

The parallel type of heated deck with two transformers is shown in Figure 2. Here, as the current merely travels across once and then returns to the transformers by means of bus bars, the wire cloth sections may be in any number of panels, even or odd. The advantage of this type of connection is that screen body modifications are not necessary, as any length of wire cloth section may be used. The disadvantage is in lower secondary voltage, which requires more secondary current and therefore more copper to carry the current. Generally, the series type of connection is preferred.

Figure 3 shows a parallel type of heated deck connection arranged for rugged, continuous duty. Notice the heavy bus bar extending across the width of the screen, which is characteristic of the parallel type connection.

In this arrangement there is a flexible distributor between the stationary bus bar and the clamping bar. The advantage of this flexible connection is that wire cloth may be changed without disconnecting the electrical conductors. Lower-priced heated deck units do not have this flexible distributor feature. Instead, there is rigid connection between the bus bar and the clamping bar. In most types of heated decks the clamping bar serves as a current conductor.

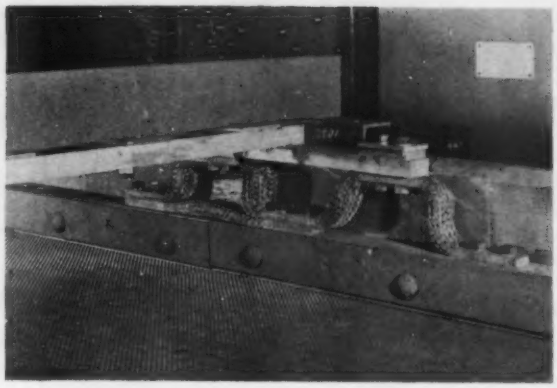


Figure 3—A deck heating unit on a 5- by 14-ft. single-deck screen, with two 24-kv-a. transformers and flexible leads connecting the bus bar to the clamping bar.

Secondary Voltages The transformers used with heated decks are designed for single-phase a.-c. operation. They range in size from 5 to 40 kv.-a. and usually employ either a 220- or 440-volt primary voltage.

The secondary voltage is determined by considering the following: type of connection (series or parallel), width of the screen, wire diameter, and type of wire that must be heated. Secondary voltage is adjusted by means of a primary tap-changing switch. Normally these primary tap-switches are designed to provide a 2 to 1 secondary voltage range. The secondaries may be from 3 to 6, 4 to 8, 7 to 14 volts, etc. The lowest secondary voltage normally employed is approximately two volts. Most industrial electrical codes limit the maximum secondary voltage to approximately 20.

For normal operation screen heating manufacturers generally recommend a secondary voltage that will heat the wire cloth to approximately 100 deg. F. under load conditions. As the surface moisture of the material being screened increases, the secondary voltage is increased. Conversely, as the surface moisture in the feed decreases, the secondary voltage is decreased. Higher secondary voltages increase the no-load temperatures of the wire cloth, as well as the power requirements of the transformer. The maximum secondary voltage that may be safely used with a given wire cloth is determined by one of the following:

1. Available secondary voltages of the transformer as determined by the primary tap switch.
2. Kv.-a. capacity of the transformer.
3. Maximum allowable operating temperature of the insulating material.

Recommended Screencloth As previously stated, these heated decks are resistance heating units. The wire cloth itself is the resistor. Type 300 series stainless steel wire is normally recommended for the screen surface, inasmuch as it requires only ⅓ as much current for the same heat as regular carbon steel.

Current Required Heated decks require a large quantity of secondary current. For example, a 5- x 12-ft. screen with 6-mesh (0.120-in. opening) and 0.047-in. diameter wire, used in a parallel circuit, requires approximately 3,500 amperes to heat the wire cloth to 170 deg. F. under no-load conditions. The above connection usually results in a 100 deg. F. temperature of the wire cloth under operation. Because of this high current, every effort should be made to keep line losses to the minimum. Three major factors influence these losses: (1) size of conductor, (2) type of insulation, and (3) efficiency of contact points.

The secondary current conductors or bus bars for heated decks should be large enough to carry the maximum currents without excessive heating. Insulation material should be able to withstand temperatures

of 200 deg. F., as well as the abrasive action of the material being screened.

Applications When limestone contains from 2 to 5 percent surface moisture and separations are desired in the range from ⅜ in. to 10-mesh, blinding generally results in less than one hour unless these screens are equipped with a heated deck. Installations for heating decks make pre-drying unnecessary to prevent blinding. At one plant, savings of over $11,000 a year resulted from eliminating pre-drying, and much more was realized from the added production gained because it was not necessary to shut down the operation to clean the screen surface.

Many operators producing agstone use heated decks. Normally agstone is the undersize product of the screen. If the screen is blinded, the product which should pass through the surface, passes over instead. When the screen is operated in closed circuit with a hammermill or some other crusher, this blinding causes the circulating load to become excessive. With blinding eliminated by a heated deck, the circulating load is reduced. This reduction means less wear on the screen itself, smaller loads on the crushers (or hammermill), and increased product yield. In an open circuit installation the elimination of blinding increases the production of agstone.

Heated decks in the limestone industry are not limited to the preparation of agstone. These units can be used whenever separations are desired at openings less than ½ in., when surface moisture will cause serious blinding.

Heated decks can also be used with uranium-bearing sand; potash; lightweight aggregate; moist, damp clay; and other materials which blind easily due to the presence of surface moisture.

Effects on Aggregates Two questions frequently arise relative to the capabilities and limitations of a heating unit. The first question is: "Will a heating unit reduce the moisture content of the material?" In other words, will the heating unit dry the material passing over the screen? The answer is,

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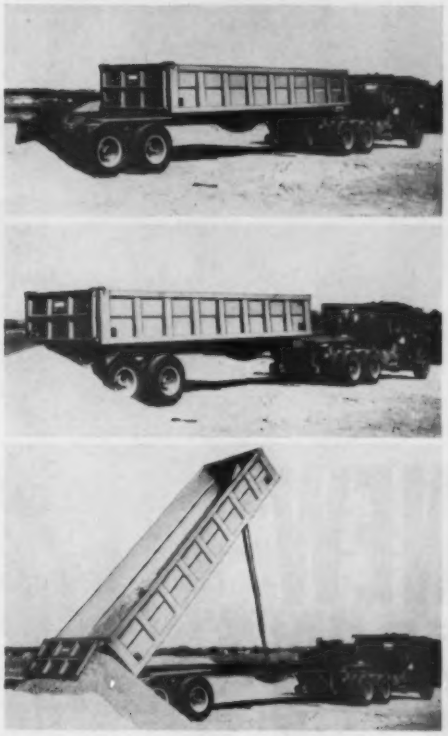

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"No." The retention time of the stone on the screen is a matter of seconds, and since the temperature of the cloth is generally in the vicinity of 100 deg. F., there is essentially no drying of the material.

The second question is: "Will a heating unit have any effect on blinding of the screen cloth due to slabby or slivery pieces?" The answer again is, "No." Although some operators claim that the heating unit tends to reduce the slabby pieces which stick in the screen cloth, there appears to be no logical reason to explain this occurrence. A ball deck can also be used to release the slabby pieces that hang up in the wire cloth. The rubber balls used on this type of deck impart a secondary vibration to the screen which frees the slabby pieces, thus preventing the blinding which frequently results from this type of material.

Summary In conclusion, the basic purpose of the heated deck is to eliminate blinding due to high surface moisture. Whenever fine screening of moist stone is necessary, when efficiency, high production, and/or close sizing are demanded, an electrically heated deck will solve the problem.

Extensive Limestone Deposit Found in East Pakistan

Extensive deposits of limestone have been discovered in East Pakistan by the Geological Survey of Pakistan. These deposits lie in a region along the northern border of East Pakistan and Assam, stretching from Tukarghat in Sylhet to Mymensingh.

The deposits are estimated at 16,000,000 tons, reportedly sufficient to produce 300,000 tons of cement annually for 30 years.

The *Eugenie P. Jones,* a new speed towboat built by Dravo Corporation, Pittsburgh, Pa., is in service on the Mississippi River and tributary streams. The 4,350-hp. craft, built for the Canal Barge Company of New Orleans, moves molten sulphur in heated tank barges from mines in Louisiana to distribution terminals farther north.

"My Boss Read the Specs with Tears in His Eyes"

He looked like he'd lost his best friend — money.

"Goodbye contract," he said quietly. "We just can't hope to meet these government specifications for aggregate."

"Yeah, it's pretty hopeless with our set-up. Of course, if we had a hydraulic classifier — " (I was kidding.)

"You're out of your mind. Around here water costs more than sand."

"Well how about an air separator, like Sturtevant makes?" I shot back. "Pete's brother runs a pit at Rapid City and says they clean sand without water. By de-dusting it."

He was skeptical. "Aren't Sturtevants for cement?"

I nodded. "They are, but you see quite a few in aggregates, too, nowadays. Might be worth a try."

The Boss smiled for the first time that morning. "What the heck are you waiting for? Get 'em on the phone and let's see what they can do."

So we got the contract, thanks to the 12 ft. Sturtevant we now use for de-dusting and pre-classification. It's a beaut. Gives good service outdoors the year round, with no protection except for the motor housing.

If you're in this business, Brother, it might pay you to have a good long look at what a Sturtevant can do for tight aggregate specifications.

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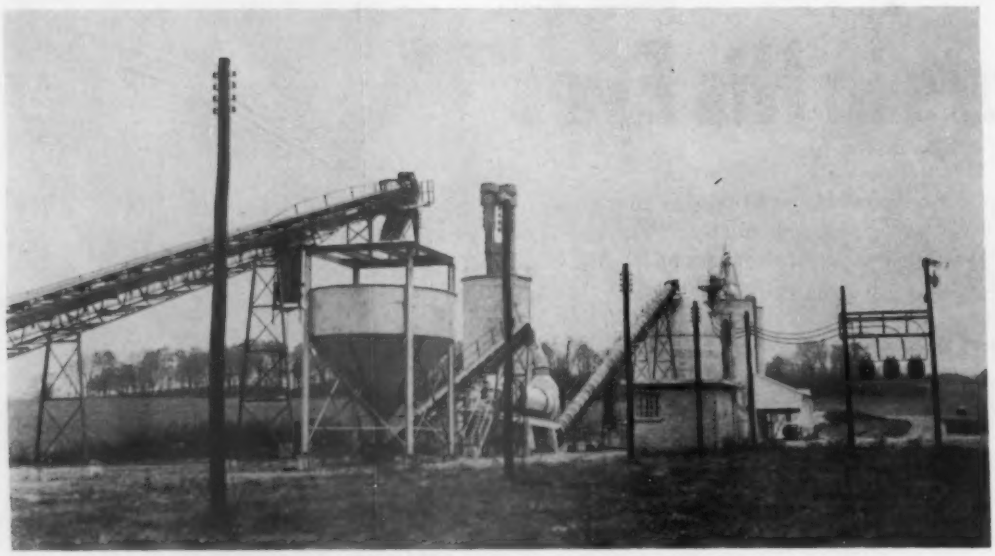

At Limeville, Ivan Martin built this plant for the exclusive production of agstone—a project that materially increased the firm's capacity in that material, and permits distribution throughout a considerably larger area.

Recent improvements and expansion of the main plant at Blue Ball resulted in more than tripled productive capacity overall, as well as in individual phases, including fine reduction.

Tailors Plants to Markets

Builds specialized agstone operation for farming needs; adds aggregate facility for wider product line

By BUREN C. HEROD

THE Pennsylvania Dutch country is noted for its industrious character — particularly in its agriculture. Less evident but equally industrious activity of agstone and aggregate operations, such as the Ivan Martin firm of Blue Ball, Pa., plays an important role in keeping the well managed economy of the region at a high level.

Keeping pace with the construction and agstone demands of its market area has meant undertaking several improvement and expansion projects for the Martin management. Ten years ago a then new primary crushing and screening facility was installed on the quarry floor at Blue Ball to supply the growing aggregate needs, particularly of Pennsylvania Turnpike construction. By 1957, that 160-t.p.h. installation was unable to meet increasing demand, and a larger, 400-t.p.h. plant was built—the older operation becoming a secondary phase. The latter also still operates in effect as a primary phase for the older original secondary crushing and screening plant at the top of the quarry.

Agstone consumption spurred the company's latest project — a new plant at Limeville, a few miles south of Blue Ball and east of Lancaster, which produces only this essential agricultural material. A good agstone business has been supplied from Blue Ball. In this section of the country the farmers are not only aware of the benefits of liming the soil, but consider it unpardonable not to maintain land at peak fertility. The new agstone operation was built to help in meeting that need; and its output, coupled with that of the older companion plant at Blue Ball, permits the firm to distribute throughout an area that takes in part of the neighboring states of Delaware and Maryland, as well as southeastern Pennsylvania.

Designed by A. R. Amos Company, as was the Blue Ball expansion, the 35 t.p.h. Limeville agstone plant is a unique, specialized operation, but built around a simple, single-pass flow. In lieu of opening another quarry at this location, a contract was made with an operator nearby to supply 1½-in. top-size raw material. This stone is trucked over from the quarry and dumped directly into the plant feed hopper.

The flow is initiated on a Syntron feeder in a conveyor tunnel below the hopper, and the stone is transported on an inclined 30-in. belt conveyor to a Butler surge bin. Surge capacity is about 240 tons, and recovery is made through a sliding gate under the bin. Conveying systems are standardized on Barber-Greene components and Thermoid belting.

Right: The flow in the Limeville agstone plant is simple and efficient. Stone from a surge tank is delivered to the dryer, center, before being conveyed to the pulverizer feed silo. At the left is a dust silo containing material recovered from the dryer exhaust.

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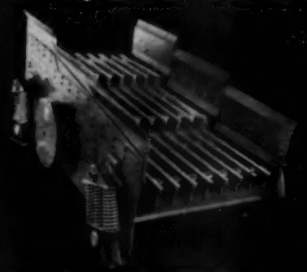

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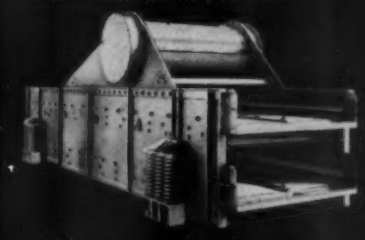

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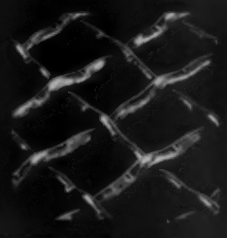

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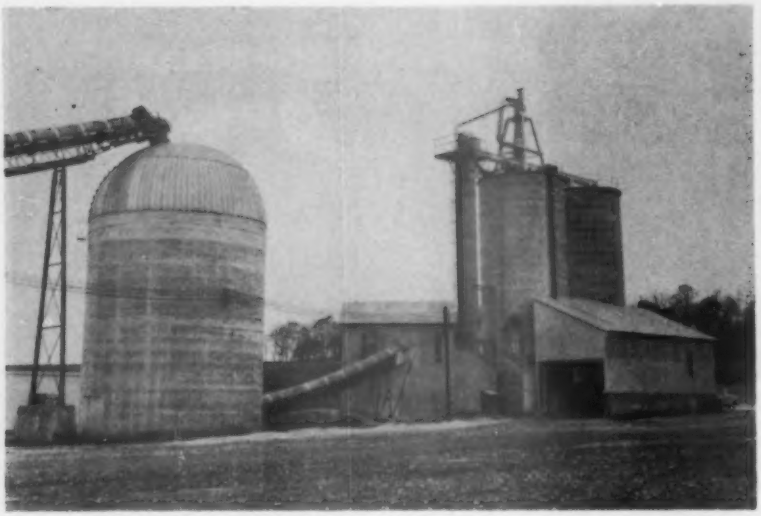

Left: Surge for the pulverizing stage is provided in the 850-ton capacity silo at the left. The structure at the center houses the pulverizer, and at the right are the 500-ton capacity finished product silos, the bagging house, and the loading dock.

Below: The 2-spout packer is installed below one of the two finished-product silos and may be supplied from either. In addition to bagged material, bulk truck shipments may be handled from either of two points in the loading dock.

Above: At the heart of the Limeville agstone operation is this 350-hp. pulverizing mill.

Right: This double impactor primary crusher installation is the first phase of the complete crushing and screening plant installed in the latest Blue Ball expansion.

At the center is the scalper, where a split is made in the crusher-run to provide plus 4-in. feed for the older plant, and minus 4-in. for the newer, which is seen at the right.

From storage, the raw material is transferred on another 24-in. conveyor to the drying stage. Here the stone is fed to an oil-fired McDermott Bros. dryer (6- by 32-ft.) in which the fuel is ignited through a North American burner. Primary air is provided by a model 22 New York Blower fan. The dryer exhaust passes through ductwork to a pair of McDermott cyclones mounted above a 250-ton concrete dust bin. Gases from the cyclones flow to a Johnson-March scrubber. Pending installation of a disposal pond, the scrubber sludge is drawn into a dump truck for transport to a disposal area.

Dried stone is transferred from the dryer on a 24-in. conveyor to an 850-ton capacity concrete silo that provides surge for the finishing phase. The grinding mill, a 350-hp. Type 6000 Bradley Hercules screen unit is fed from the surge silo *via* a short conveyor connecting the silo and the mill building. Stone is delivered *via* sliding gate from the surge to the mill feed belt.

Mill discharge is transferred by a screw conveyor to a Link-Belt bucket elevator that, in turn, supplies the distributing screw conveyor at the top of a pair of 500-ton capacity concrete silos. Both bagged and bulk shipments are accommodated from the loading station at the base of the silos. When the products are bagged, draw may be made from either silo to supply a 2-spout Black Products packer. In loading for bulk truck shipment, the agstone is transferred by Airslide from one silo and by screw conveyor from the other to loading spouts in the truck dock.

Some shipments have been made as far as 100 miles from Limeville. As a part of its distribution system, the company has built a bulk material warehouse at Felton, Del. to which agstone is transported in trailers.

Production in this efficient operation requires the attention of only one man in addition to superintendent Lester Martin. Billing and dispatching from the Limeville office is handled by C. P. Shirk.

Agstone is also an important segment of production in the expanded operations at Blue Ball, rounding out a complete product line that includes ready-mix and bituminous concrete aggregates, and road base materials. With the installation of the newer equipment a few years ago, more flexibility in product range was realized. Some sizes can now be made that were not made before, and a greater regrind capacity is available.

The latest installation, incorporating primary and secondary reduction, and screening phases, is a complete plant in itself. As noted earlier, it was built on the quarry floor adjacent to the older primary facility. Although designed as a 400-t.p.h. operation, it has easily handled 500 t.p.h. Most effective utilization of the older primary plant was assured in the planning of the newer by providing a split flow, as described later, from the scalper.

In the Blue Ball quarry, the high-calcium limestone formation is highly folded, faulted, and fractured. Operations are carried out on a 90-ft. face, with drilling done under contract, and blasting by Trojan Powder Co. on a time and materials basis.

A ¾-cu. yd. Northwest backhoe is used to strip ahead of drilling. The latter involves sinking one row of 6-in. diameter holes on a 16-ft. spacing, and with a burden of 25 ft. A 6-hole shot will meet the plant's requirements for nearly two weeks.

Two 1½-cu. yd. Northwest shovels are used to load out of the quarry, and the broken stone is hauled to the plant feed hopper by three Euclid trucks. At the new primary crusher installation, stone is transferred from the hopper on a 4- by 18-ft. Telsmith feeder to a following 5- by 10-ft. Hewitt-Robins vibrating grizzly. This unit makes a 4-in. split of the quarry-run material—the oversize passing directly into the 4650 Universal double impactor primary crusher, driven by a pair of 150-hp. motors.

Grizzly throughs are received on a belt conveyor for transfer to a truck bin. Mounted above the bin is a company-fabricated dust collector that services the primary crusher installation. If desired, the grizzly throughs may be chuted from

(*Continued on page* 162)

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Ellernan Calciners treat small-size LIMESTONE, DOLOMITE, PHOSPHATE, GYPSUM, CLAY, etc. The unit preheats, calcines and cools automatically and continuously with exact temperature control. Completely flexible . . . Ellernan Calciner installations are adaptable to any size plant, to handle any capacity.

Write or wire for full details to

THE ELLERNAN COMPANY

1122 Continental Bank Bldg.
Salt Lake City, Utah

Serving the Industry Throughout the World

Enter 158-B on card, page 217

BOSTRON

THE BELT WITH THE HAZARD-PROOF CARCASS!

WILL NOT ROT OR MILDEW — Constantly running salt water cannot rot or mildew 2-ply BOSTRON belt at J. H. Miles Co., Norfolk, Va. No deterioriation from fastener rust, no fastener holding problems.

OUTSTANDING WEAR — Constant impact and friction from razor-sharp oyster shells has not affected the ⅛" Dulon Cover on this BOSTRON belt. Says Mr. Frank M. Miles, President, "Our BOSTRON belt is good as new after 4 years operation . . . Exceeded every expectation!"

BOSTRON'S hazard-proof carcass, combined with Balanced Belt Construction, makes your investment in a superior Dulon Cover the most sensible, dollar-saving way to buy belts for your requirements.

An exclusive research milestone by

BOSTON
SINCE 1880

AMERICAN BILTRITE RUBBER COMPANY
BOSTON WOVEN HOSE & RUBBER DIVISION
BOSTON 3, MASSACHUSETTS

AMERICAN BILTRITE RUBBER COMPANY PQ
BOSTON WOVEN HOSE & RUBBER DIVISION
Boston 3, Massachusetts

Please send free illustrated literature about the new hazard-proof BostRon Belts.

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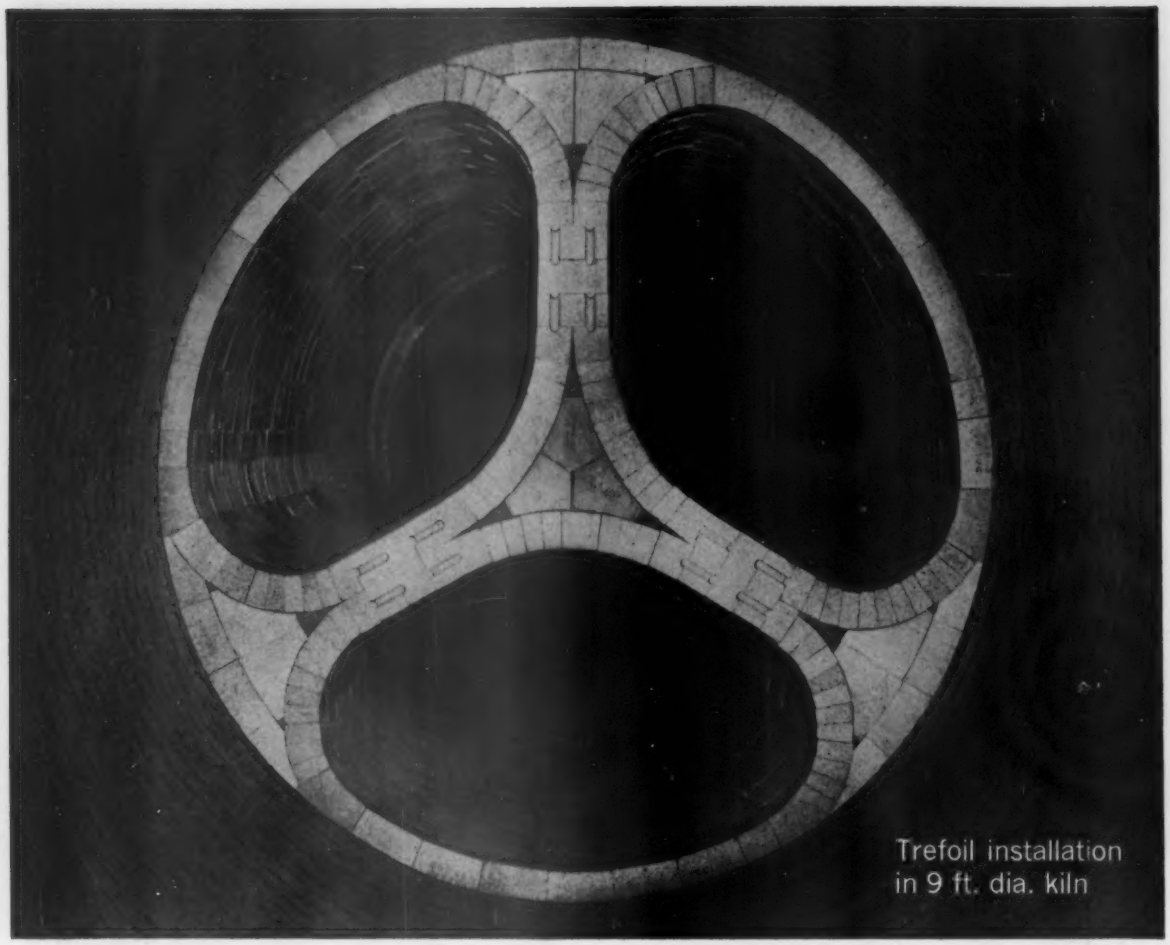


Refractory Heat Exchangers increase rotary kiln efficiency

Harbison-Walker TREFOIL design provides important benefits

This construction built with refractories especially suited for the purpose is showing exceedingly gratifying economies in rotary limestone and lime sludge kilns. Its use is the means of imparting sensible heat to the charge, even to the degree of partial calcination in some installations.

The structural strength of the trefoil construction is proving its excellent durability. An original installation in a 10′ diameter kiln has now been in service for three years, with indications of considerably longer life. This good service presently is approaching repetition in a number of other kilns.

The magnitude of preheating of the charge in passing through the trefoil tends to moderate the temperature in the hottest zone, necessary for a given rate of production. The development of excessive accretions in the high temperature zones with certain fuels may be reduced and the lining life extended.

Net results from the use of the trefoil are fuel savings and increased production in kilns which are not greatly overloaded beyond rated capacities.

H-W technical service is freely offered in helping determine various details such as length of the trefoil section (usually 15 to 25 ft.) and longitudinal location for the various conditions involved.

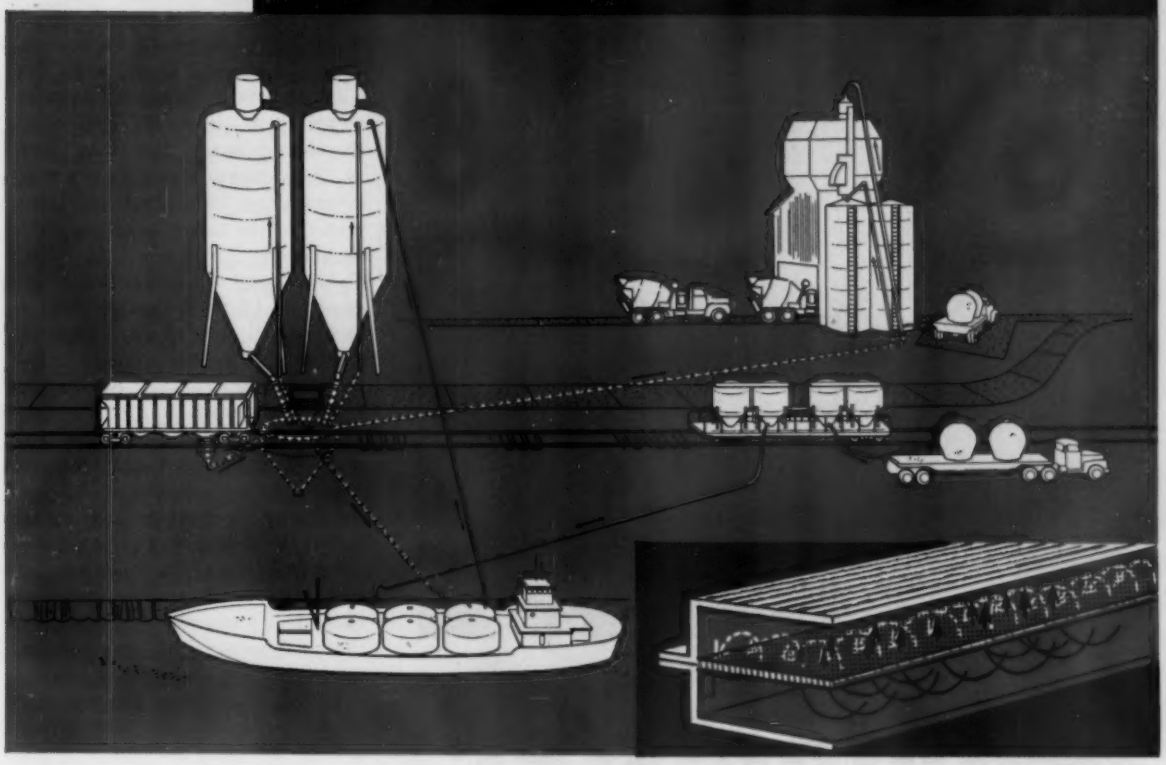
Harbison-Walker Refractories Company
AND SUBSIDIARIES
GENERAL OFFICES: PITTSBURGH 22, PENNA.

World's Most Complete Refractories Service

HW 60-3

HALLIBURTON **bulk handling** SYSTEMS

. . . tailored to your needs ***pneumatically!***



If the movement of dry bulk materials is important in your business . . . your plant . . . or operations within your plant . . . *you will profit* with some of the material handling ideas shown in the drawing above.

This hypothetical arrangement illustrates the flexibility of Halliburton Pneumatic Bulk Handling Equipment and Systems. The heart of a Halliburton System in moving powdered, granular, and most pelletized materials, is in the air pressure pumps which move materials rapidly in a closed system.

Halliburton manufactures complete units for over-the-road and rail transport, as well as systems for marine installation. Complete design and turnkey installation of custom-engineered Pneumatic Handling Systems is also available from Halliburton.

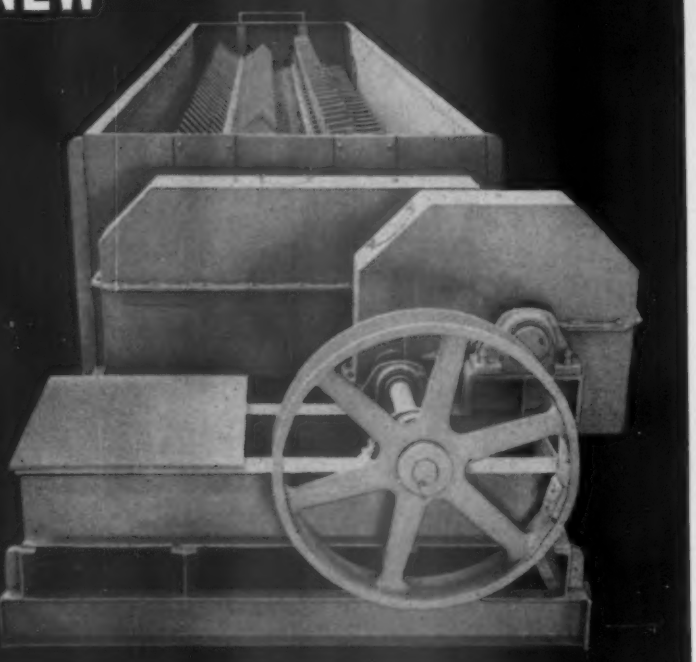
Find out how clean, efficient pneumatic materials handling can work for you! Contact your Halliburton Representative, or write direct to . . .

SPECIAL PRODUCTS DIVISION

LOW COST MATERIAL ROUTING . . .
anywhere you can run a pipe!

Halliburton
COMPANY DUNCAN, OKLAHOMA

NEW··· LOG WASHER DEVELOPMENT



McLANAHAN

Mudmaster

now with Higher-Output 12" Logs

Proved a profit-maker by many dozens of progressive operators, the Mudmaster Log Washer is a powerful, rigid, efficient and economical machine—outstanding for low-maintenance performance . . . effective for cleaning gravel, limestone, phosphate, manganese, iron and other ores. Now with 12" Log models to supplement 10" Logs previously available, the Mudmaster is made in 20', 25' and 30' lengths. *Write for New Bulletin and Price Data.*

McLANAHAN Corporation

HOLLIDAYSBURG, PENNSYLVANIA

Pit, Mine and Quarry Equipment Headquarters Since 1835

Enter 162 on card, page 217

Pennsylvania Operator

(*Continued from page* 157)

the above belt to the conveyor that receives the primary crusher product, both materials then flowing to

At this point the basic split of plant feed is made. The 5- by 14-ft. Allis-Chalmers double-deck scalper has a 4-in. opening top deck, and a 2½-in. opening bottom deck. Plus 4-in. material is pulled off and conveyed to a surge pile from which the older primary plant is fed. Both of the remaining fractions are received on a 30-in. belt and transported to the newer screening plant. the scalper.

The latter is comprised of a group of 12 truck-loading bins, in two parallel lines of six, supporting six Telsmith screens arranged in two lines of three. The first two screens in each line are 5- by 12-ft. double-deck units, and the final one is a 4- by 12-ft. double-deck. Since the bottom-deck throughs of each of the first two screens in each line are fed to the following unit, a total of six fractions may be made in each line. The retained fraction from each deck, and the throughs from the final screen, are dropped into the appropriate underlying bin.

Instead of dropping into bins, any of the larger fractions may be delivered through a flopgate to a conveyor and chute system feeding the 48SC Telsmith Gyrasphere secondary crusher. Secondary reduction is made through a 3/16-in. setting, and the crusher product is returned to the screen feed belt in closing the circuit.

Provision has also been made to pull larger fractions from their bins onto a short conveyor leading to the older plant. This permits getting material to the fine-grinding plant at the top of the quarry in case the normal feed system to the older plant is down, or if there is an interruption of processing in the older facility.

Plus 4-in. crusher-run stone from the scalper is placed on a surge pile, as indicated previously, and is recovered on an underlying reclaiming conveyor for feed to the older plant that now operates as a secondary phase. Crushing and screening circuits in this installation involve five Telsmith crushers—one 13B, two 36 standards, and two

36FC units. The 13B handles initial reduction preceding the other four crushers. Screening and recrushing as now set up delivers material of 1⅛-in. top size.

The entire flow from the secondary operation is placed on a 24-in. by 324-ft. inclined conveyor and carried up to the fine-grinding plant, 98 ft. above the quarry floor. Here it is split to a pair of triple-deck screens on which corresponding decks, top to bottom, make ½-, 3/16-, and ⅛-in. separations. Material retained on similar decks of the two screens are chuted into the same underlying bin.

Part of the largest fraction is fed to a 2440 Universal double-roll crusher which operates in closed circuit with a pair of 4- by 10-ft. Hewitt-Robins double-deck screens. These make separation on ¼- and ⅛-in. screencloth, the plus ¼-in. fraction being returned to the roll.

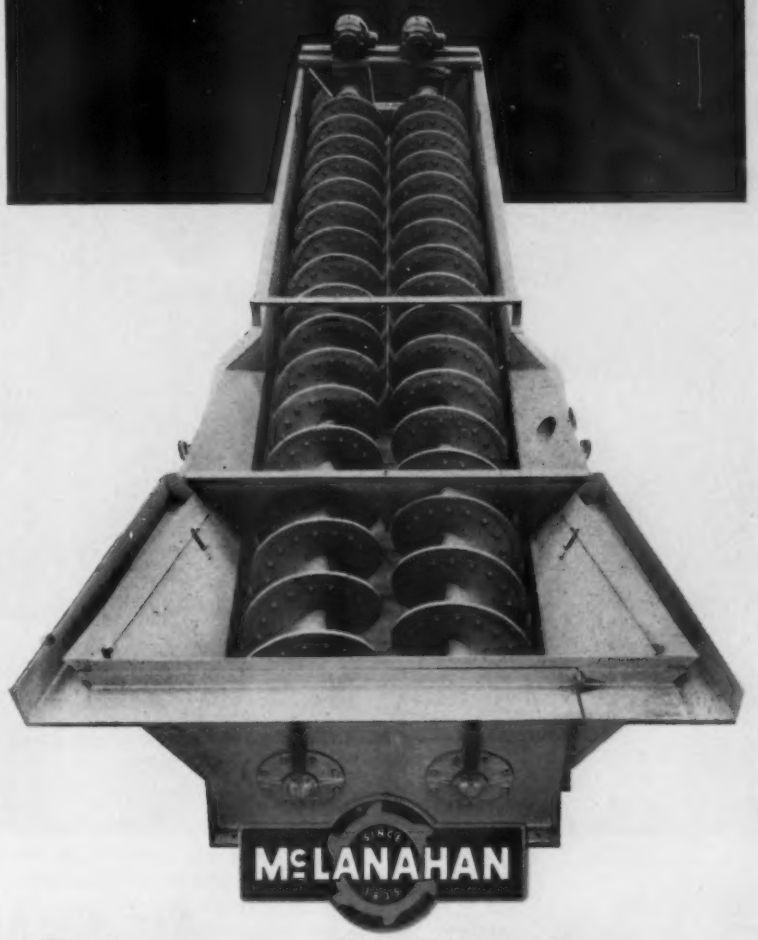
The agstone phase of the fine-grinding plant is also supplied with 1⅛-in. feed. This is first delivered to a Posey Iron Works dryer, and the dried stone is then ground in a 400-hp. Bradley Hercules mill. The finished product from the mill is raised in a bucket elevator to an agstone truck-loading bin.

Truck loading of any product at Blue Ball may be handled direct from the bins, or from stockpiles by a pair of 2½-cu. yd. Michigan loaders. The company maintains a fleet of 12 trucks for servicing customers and also utilizes contract haulage. All loads are weighed out over a Fairbanks-Morse truck scale at the modern new office building on the plant site. Three agstone spreaders are also operated by the company, but the greatest tonnage of agstone is handled by distributors.

In view of the varied processing installations at Blue Ball, the operation requires a relatively small crew. From quarry face through the two plants on the quarry floor and the third at the top, production and loading are handled by a 16-man crew under Amos Weber, superintendent. Overall-operations are headed by Ivan Martin, president.

The St. Lawrence Cement Company, Villeneuve, Que., has purchased all assets of Associated Quarries & Construction, Ltd., Toronto.

all the features that mean
HIGH-PROFIT TONNAGES
for you



Screw Washers

• *Superior System for Controlling Fines*—low turbulence, extra-large flared settling area, adjustable overflow weirs • *Rigidly Constructed Box* • *Improved Drive*—fully enclosed, with all gears running in sealed oil bath, simplified direct-shaft reduction • *Durable Screws*—renewable hard-iron, spiral steel flights with segmented wearing shoes on extra-heavy pipe shaft.

Ask for Bulletin SW-80.

McLANAHAN Corporation
HOLLIDAYSBURG, PENNSYLVANIA
PIT, MINE AND QUARRY EQUIPMENT HEADQUARTERS SINCE 1835

Enter 163 on card, page 217

450 FEET

OF TRAYLOR KILN EFFICIENCY

Shown above is one of two 12′ x 450′ Traylor rotary kilns designed and built to meet the requirements of the Standard Lime and Cement Company, Martinsburg, West Virginia. Both are wet process kilns driven by dual drives with forged steel riding rings and forged steel supports. These kilns feature the Traylor-designed chain systems and dust return scoops. They are fed by a Traylor slurry feeder.

Write today outlining your kiln requirements and let our engineers make recommendations . . . or write for Bulletin No. 1115.

TRAYLOR ENGINEERING & MANUFACTURING
DIVISION OF FULLER COMPANY
1556 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P.Q.

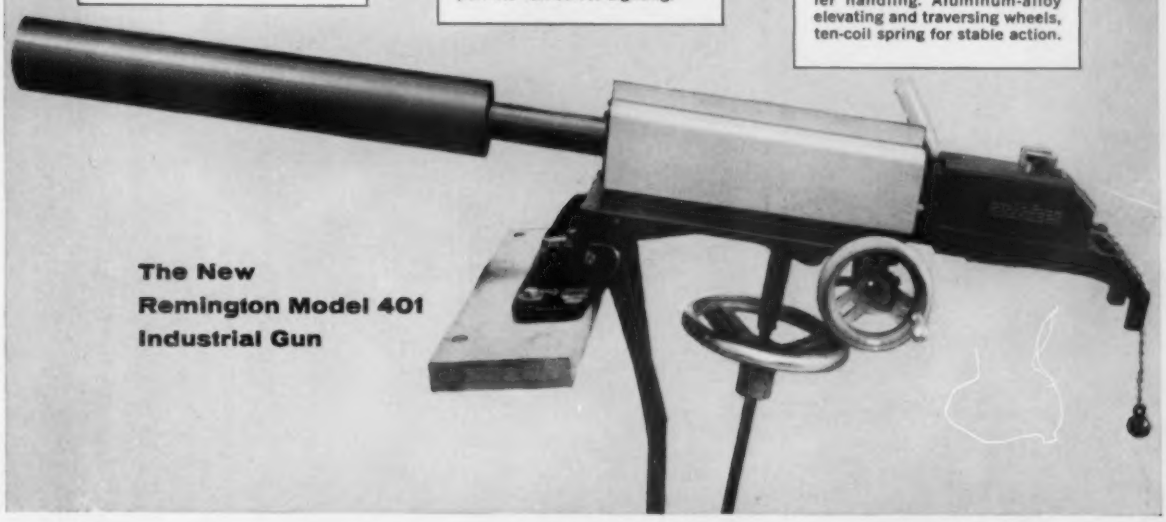
TKA-8

New— Remington Industrial Gun
offers you these operating advantages—

NEW Built-in Muffler... reduces firing noise up to 50%. Strong, one-piece welded construction. Removable.

NEW Stellite-Lined Barrel... gives constant energy to slug, improves ejection, and gives longer barrel life. Breech design permits full-barrel sighting.

NEW Lighter Construction and Recoil Action... makes for easier handling. Aluminum-alloy elevating and traversing wheels, ten-coil spring for stable action.



The New Remington Model 401 Industrial Gun

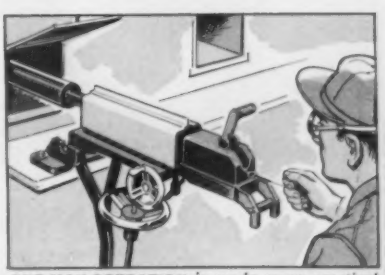
Remove clinker rings in minutes ...save time and money!

You save valuable kiln downtime and man-hours in removing clinker build-ups with the new hard-hitting Remington Model 401 Industrial Gun. It's designed for use in rotary kilns for cement and lime manufacture, refractories and lime-sludge operations. This newly designed gun brings rings and other troublesome kiln formations down in minutes!

No need to wait until the kiln cools. In fact, there's no need to turn off flame or stop rotation until ready to fire. To operate, just load—aim—FIRE—and up to 9,000 ft.-lbs. of knockdown power smashes into the clinker build-up. A few well-placed shots and rotation of the kiln will cause the ring to crumble. Then you're back on a full-time schedule!

Here's the easy, cost-saving way to remove build-ups—without damage to kiln or lining. The new Remington Industrial Gun and one man can save you money.

For information about the advantages of this new gun and how it will help solve your clinker build-up problems, write to the address below.



ONE-MAN OPERATION is made more practical by the special construction of the new Remington Industrial Gun • Spade grip and special corrugated operating handle reduce strain for the operator • Safety features include provision for a protective shield which can be fitted to kiln opening to block heat and clinker fragments • Mortised breech block makes it impossible to fire when breech is not fully closed • New-type ejector gives positive ejection of fired shell. Simpler in design—has longer life.

3 REMINGTON INDUSTRIAL SHELLS
for variety of power...

Magnum Shell — new, improved — 3-oz. special lead-alloy slug — delivers 9,000 ft.-lbs. of energy accurately, every shot.

Standard Shell — 3-oz. lead slug — delivers 7,500 ft.-lbs. of energy for shorter kilns.

Special Shell — 2-oz. special zinc-alloy slug — delivers 7,500 ft.-lbs. of energy.

All shells now available in new easier-to-handle packing.

Remington

DUPONT

Remington Arms Company, Inc., Bridgeport 2, Connecticut
In Canada: Remington Arms of Canada Limited, 36 Queen Elizabeth Blvd., Toronto 18, Canada

Enter 165 on card, page 217

Smidth Unax Coolers

FOR ROTARY KILNS

FOR LIME,
DOLOMITE,
LIME SLUDGE,
ALUMINA,
CEMENT
AND ORES

More than 600 Smidth Unax Kilns supplied in the last thirty years.

Unax cooler affords simple and economical installation; effective cooling and efficient heat recuperation. For many processes it surpasses any other type of cooler for rotary kilns.

Photos: Unax kilns in paper pulp mills

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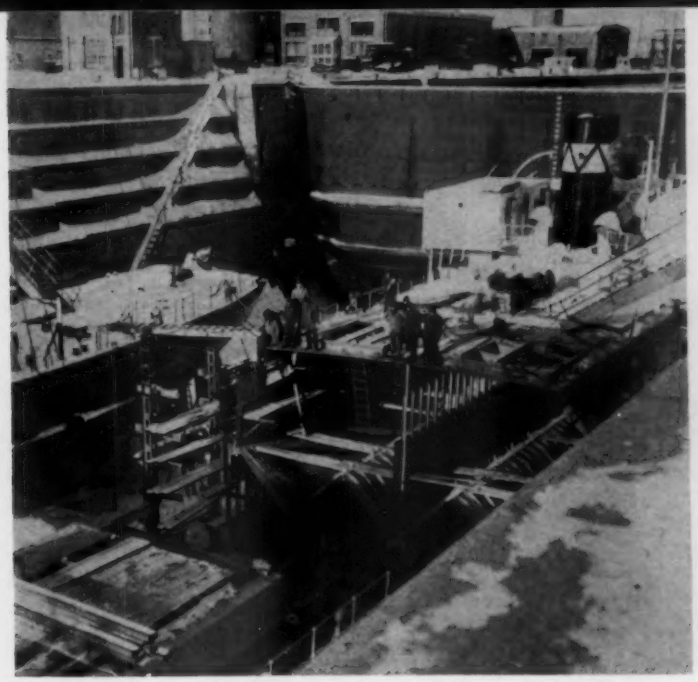

Above, left: At this point the ship had been severed, and the new sections were being assembled.

Above, right: This view shows the new four-blade manganese bronze propeller and the rudder. Note the Costa-bulb, which was fitted to the existing rudder.

Canada Cement's *Cementkarrier*

has more length, more cargo, greater speed, same power

By HUGH G. JARMAN

THIS is an account of what the Canada Cement Co. Ltd. achieved when its M/V *Cementkarrier* went into drydock during the winter of 1959-1960. It was the same old story—higher labor costs, stronger competition, and the St. Lawrence Seaway, a combination which put the firm's self-unloading vessel into the "unprofitable" category.

According to John Stoddart, senior project engineer for the company, there were many other things, including a lower level on Lake Ontario, causing lower draft, and reducing the ship's carrying capacity. Something drastic had to be done. Studies were made of every possible scheme for increasing cargoes from the No. 5 plant *via* water. All of them, after design studies and estimates of capital and operating costs, timetables and cargoes, had to be eliminated.

Nothing but a major alteration to the ship could accomplish the desired results. Milne, Gilmore & German, Naval Architects, were engaged to solve the problem. Upon the advice of the architects, it was decided to have the vessel lengthened.

The conversion had to be made during the winter months; so, after carrying her last load of cement for delivery to Lake Ontario ports, the *Cementkarrier* made a quick turn-about, picked up another load, and headed through the St. Lawrence Seaway system, passing through the last lock on the last day of the 1959 season. She made her way down to Quebec City, unloaded her cargo, and headed across the St. Lawrence River to the Davis Shipbuilding Company, entering the drydock on December 4, 1959.

Normal winter lay-up work proceeded on the ship while the architects and shipyard completed the detail drawings for the conversion. An architect's representative looked after the owners' interests during the conversion. The new ship section designed by the architects was to be 48 ft. long, including 30 ft. for new water ballast tanks, and 18 ft. for a new cargo hold.

This proportion may seem strange. However, the ship originally had extra cargo space at full draft which she was never able to utilize, due to low water levels on the routes she covered. The 48-ft. extra length would supply the necessary additional buoyancy for cargo in the new hold, and would permit loading the original ship's holds to their normal designed capacity.

Large new water ballast tanks were required to counteract the extra buoyancy, and to keep the propeller submerged, with no cargo aboard; this had not been possible before. An additional ballast pump was also to be installed to handle the increased load.

In the preliminary design stages it was found that the most practical arrangement for the new section

The vessel after completion and installation of the enlarged mid-section. The ship is now 307 ft. long.

would be to divide it into two portions—the forward portion for an extra cargo hold, the aft portion for a divided ballast tank. This arrangement gave the vessel the preferred trim condition, in both loaded and ballasted conditions.

Incorporated in the port and starboard ballast tanks were two 10-in. deballasting valves, fitted at the light load line of the ship's side. Upon arrival at the loading port in full ballast condition, these valves would be opened, permitting the deep tanks to empty down to the valve level and thus speeding up the general discharge of ballast by the usual pumps.

Since the ship is a self-unloading vessel, equipped with Fuller-Kinyon cement-pumping equipment, the cargo-discharging gear had to be lengthened to suit, and the discharge piping had to be modified to pass under the main deck to the discharge station at No. 2 hatch.

On January 11, 1960, the conversion job was started. Special ways and guides were installed under the forward section of the ship, and cutting of the hull was started.

On January 18 the forward section of the ship, being completely severed, was hauled ahead 53 ft., an operation which took only two minutes. Installation of the new mid-section started immediately. It was fabricated in several 20-ton parts in the shipyard. These parts were ready for installation as the ship was being prepared to receive them. The new section, of all-welded construction, was completed and joined to the aft section of the ship, and the forward part of the ship was then moved back to connect with the new mid-section, after which all joints were securely welded.

To strengthen the decks of the longer ship, heavy doubling plates were installed for half the length of the ship on each side. To meet classification requirements of the dimension between the collision bulkhead and the stem, a false bow approximately 3 ft. long was fabricated and welded to the existing bow. All cargo hatches were raised 24 in.

Since no changes were to be made in the propulsion machinery, it was necessary to take steps to increase the propulsion efficiency in order to realize maximum speed. To achieve this, a new four-blade bronze propeller designed to absorb the main engine rated output at increased revolutions, was installed.

A Costa-bulb was fitted to the ship's existing rudder. These modifications resulted in greatly improved propulsion. The entire conversion was under the supervision of the naval architects.

On April 13 the ship was refloated. Her first cargo was a full load of cement from the No. 1 plant, a part of it for the Seven Islands and the remainder for the Quebec City Storage. Two naval architects and their engineer were aboard for this trip, recording trial data. Speed trials were held with both full and half loads. It was found that the ship, with her new length, larger cargo, and lighter draft, actually had increased speed, and her owners pronounced her performance very satisfactory all around.

Comparative data on conversion appears in the table on this page.

It will be noted that the maximum allowable draft has been reduced, which is in accordance with Lloyd's Rules. This means that the greatest cargo increase, percentagewise, is at the shallower drafts, which is exactly what the Canada Cement Company wanted.

Item	Before Lengthening	After Lengthening
Length O.A.	258′-0″	307′-6″
Max. draft fresh water	16′-7½″	15′-11¼″
Net cargo at max. draft	16,285 bbl.	19,954 bbl.
Net cargo at 14′-0″ draft	11,600 bbl.	15,863 bbl.

$250,000 Dust Collector Planned at Permanente Plant

Permanente Cement Company will spend more than $250,000 at Bellingham, Wash., to improve its dust collection facilities.

A contract has been let to the Koppers Company, Inc., to build and install the electrostatic precipitator, which will be installed on two wet-process kilns. Koppers will build the precipitator adjacent to the existing flues without affecting operation of either kiln.

how well do you know

INSURANCE LAW PROBLEMS?

How do you, as a plant operator, stand on the queries presented in the accompanying Business Insurance Guide?

By G. T. MEDLOCK
Attorney at Law
Member, U. S. Supreme Court Bar
and
R. D. STEVENS
Management Consultant

CONTROL is the means management has of keeping score on nonmetallic minerals plant operations; therefore, it is important to earning profits. In devising effective control, how well do you know your insurance law problems?

It should be kept in mind that insurance law is a branch of contract law. It is very important, and a plant operator should know all he can about it. Here are some points to note.

What Is Insurance? Insurance has been defined as *a contract of one to indemnify another against damage or loss or liability or diminished property value which might arise from a contingent event.*

Indemnity is the essential ingredient of every contract of fire insurance. Usually, the contract of insurance defines the perils for which the insurance is issued.

For instance, title insurance indemnifies the insured against a defective title; fire insurance indemnifies the insured against loss or damage by fire; and, life or accident insurance covers the insured against death or injury by accident.

Usually a contract of insurance has exclusive exemptions, sometimes found in very *small print*, a fact which makes it imperative for you to read your policy with utmost care. The consideration of a contract of insurance is called the *premium;* but the contract of insurance itself is called the *policy.*

A life insurance policy is not purely a contract of indemnity but is a *promise* to pay a certain sum upon the performance of conditions precedent.

Inasmuch as the various types of insurance contracts that are prepared at the present time are so numerous, it is to your advantage to know and understand something about the subject, including the application, representations, warranties, insurable interest, proof of loss, termination or lapse, assignment of policy, and payment.

Insurance companies are *regulated* by various state laws, owing to their public nature and importance. Every company which deals with insurance is subject to the control of a state insurance commission, or authority, which conducts investigations and requires periodic reports concerning its insurance business activities.

The courts are kept very busy determining the nature and extent of contracts of insurance, since it is quite difficult to set down the formula for deciding losses incurred under the various types of insurance

BUSINESS INSURANCE GUIDE

DO YOU HAVE

- A *fidelity bond* to protect your company against loss caused by employee dishonesty?
- A *forgery bond* to cover losses caused by forged or altered checks and other negotiable instruments?
- *Burglary, robbery, theft,* and *larceny* insurance as a protection against such crimes?
- *Accident* and *health* insurance to improve employee relations?
- *General liability* insurance to provide protection against damage claims?
- *Manufacturers'* and *contractors' liability* insurance for your operations?
- *Automobile liability* and automobile physical damage insurance for your employees and agents?
- *Boiler* and *machinery* insurance to save your business from financial losses caused by accidental explosion or break-down of your heating and power equipment?
- *Credit* insurance to protect your company from losses over and above normal bad debt losses?

policies issued. However, the parties to an insurance contract are required to act in the utmost good faith, whether their negotiations entail property or personal insurance.

Kinds of Insurance It is impossible to elaborate on the various types of insurance policies. We deal here with some of the most commonly known contracts.

Possibly the best known is the *life insurance* policy, a contract by which the insurer, for consideration of payment or the promise of a certain sum, promises to pay a stipulated amount upon the death of the person mentioned therein, if the contract was not based on fraud and the premiums are paid when due.

Among the most common types of life insurance are ordinary life, industrial, and group insurance. Many insurance companies would decline to accept an application for insurance unless the applicant is an *insurable* risk. This is determined by such things as his age, occupation, habits of living, family history, and of course, his health. Usually, life insurance policies are very clear and concise as to the amounts to be paid to the beneficiary in the event of the death of the insured.

Practically all property, and certainly your company property, is covered by *fire insurance*. You would find yourself seriously handicapped in having to replace your building if it were destroyed by fire; but you could pay the premium to carry fire insurance on your building and thus be indemnified.

It should be noted that some, but by no means all, insurance policies carry a provision that the beneficiary shall be notified in case the insured wishes to change the beneficiary.

In the event of a sale of property, the insurance therein is not transferred unless the contract of insurance so provides, or unless there is an express assignment. Life insurance may be assigned in certain instances, such as to secure a debt. Such assignment entitles the assignee to the amount of his or her claim, and no more. In the event of an assignment, the insured continues to pay the premium.

The objectives of *property insurance* is indemnification of loss; and the person owning the insurance policy incurring the loss is not allowed to recover any more than the value of the property at the time of its loss.

Business insurance covers many things. For instance, fidelity, forgery, surety bonds, and burglary insurance. In addition, there is general liability insurance, embracing all kinds of insurance; it provides protection against damage claims. Credit insurance, however, provides protection against abnormal and inordinate bad debt losses, as distinguished from the normal bad debt losses that can be allowed for in the selling price.

Owners', landlords', and tenants' *liability insurance* is primarily designed for stores, apartment houses, hotels, motels, theatres, and other businesses in which a principal is exposed to damage claims from the presence of the general public on the premises.

There are two principal types of *automobile insurance:* automobile liability insurance, which protects the car-owner or operator against damage suits resulting from an automobile accident; and automobile accident damage insurance, which reimburses the owner for loss of or damage to his own car. By obtaining automobile liability insurance, a car-owner transfers to the insurer his *legal liability* for money damages in case of an accident which may cause injury to others or to their property.

Accident and health insurance is designed to include one or a number of types of benefits—such as loss of time, hospitalization, and surgery.

Cancellation Much has been written on cancellation of insurance contracts. Some insurance policies are *not* cancellable, and some are cancellable after a period of a certain number of years. Many are of the opinion that health and accident policies should not be cancellable after a period of years, except in the event of fraud in the procurement of a policy.

Notice of cancellation must always be given to the person liable for the payment of the premium. Usually, when a policy of insurance is cancelled *before* a premium payment, the company tenders the unearned premium to the insured. This must be a complete and free tender and not a mere offer to return the premium. It is usually an unknown factor, but not in the legal field, that the insured might waive the requirements that the unearned premium be returned.

As far as the insured is concerned, keep in mind that only the person designated in the policy has the right to cancel the insurance policy. It follows that cancellation of the policy *terminates* the contract of insurance.

Many lawsuits occur because damages result from wrongful cancellation of insurance. Matters regarding *wrongful* cancellation of insurance policies concern *facts* to be determined by a jury. It appears that there is no exact rule for determining the amount which may be recovered if an insurance policy is wrongfully cancelled. *Each case* is decided by the facts involved.

Fraud used in procuring an insurance policy is always ground for cancellation. It is elementary that failure to pay the premium on a policy cancels the contract of insurance. If the premium has not been paid, if there is no statute to the contrary, no notice of cancellation is necessary. The insured has no absolute right to request reinstatement after cancellation for nonpayment of premiums.

In procuring a fire insurance policy, if there is a misstatement made by the insured as to the age or value of the property, this is ordinarily a sufficient basis to avoid payment in case of destruction or damage by fire, provided that such misrepresentation is material to the risk. As a general rule, a house which is insured is presumed to be occupied, in the absence of a waiver. Some insurance companies will allow a temporary vacancy, provided that they are notified of such contemplated vacancy.

It frequently happens that an insurance company may write in a provision requiring the employment of a watchman or certain appliances for extinguishing fires. In this event, failure to comply with these terms may result in voidance of the policy.

If there is a large stock of insured goods or products involved, the insurance policy will usually require that certain books and records

(*Concluded on page* 196)

Enter 171 on card, page 217 →

Pre-Engineering by **KAISER ENGINEERS** answers basic plant expansion questions...

Timely? Many complex factors shape the final decision to proceed with your expansion plans...and timing is an important one. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. The studies and evaluations furnished by KE Pre-Engineering represent only one phase of total KE services. Kaiser Engineers is an experienced designer and builder of all types of facilities for the Minerals industry. From Pre-Engineering through design and construction, Kaiser Engineers provides complete, one-company service and ingenuity based on years of experience.

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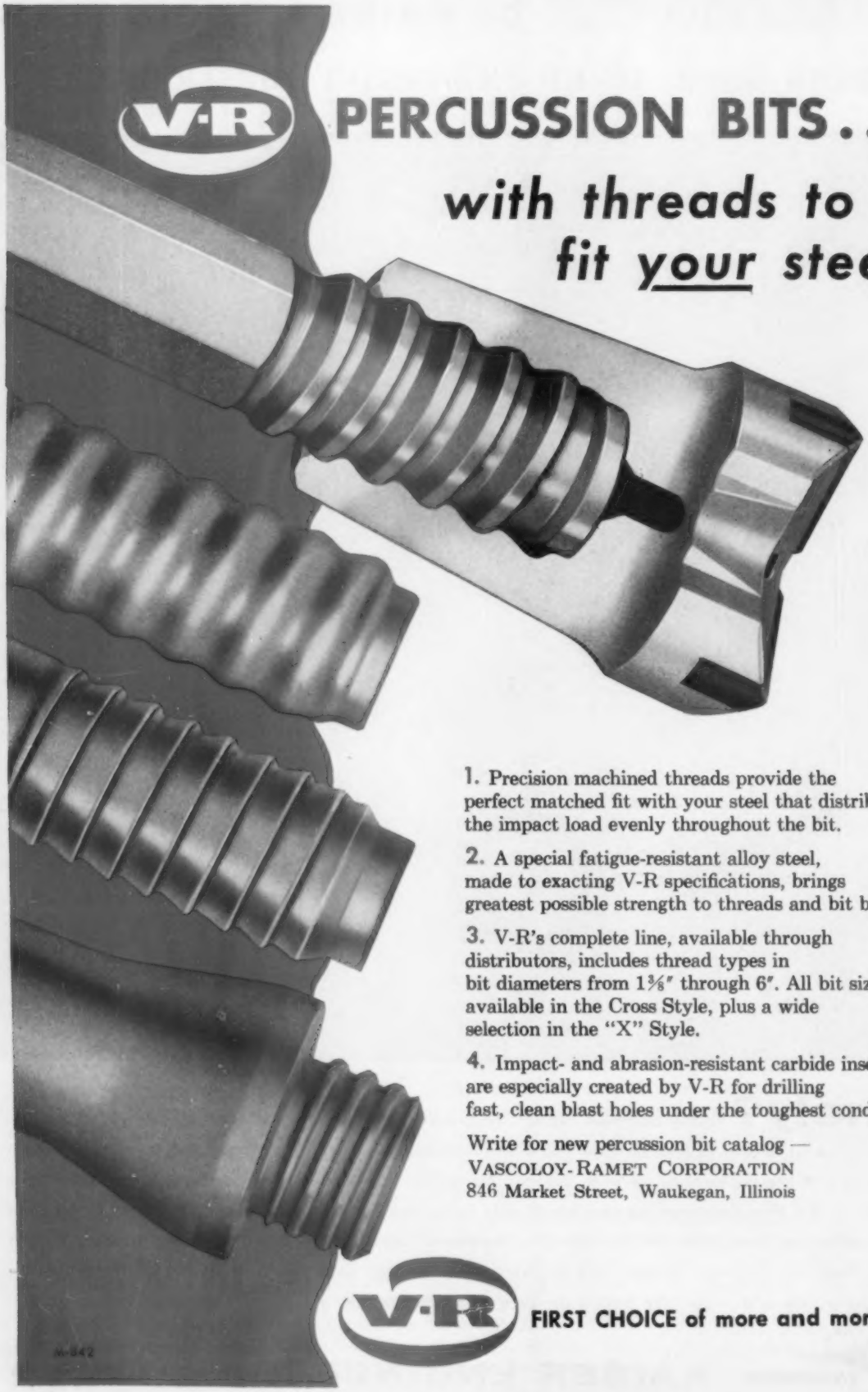

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1. Precision machined threads provide the perfect matched fit with your steel that distributes the impact load evenly throughout the bit.

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4. Impact- and abrasion-resistant carbide inserts are especially created by V-R for drilling fast, clean blast holes under the toughest conditions.

Write for new percussion bit catalog —
VASCOLOY-RAMET CORPORATION
846 Market Street, Waukegan, Illinois

V-R FIRST CHOICE of more and more drillers

L. J. Venard, Minneapolis, Minn., elected president of the Vermiculite Institute.

Vermiculite Producers Report Bright Prospects At 20th Annual Meeting

OPTIMISM and confidence in the future pervaded the 20th annual meeting of Vermiculite Institute, held March 18 to 23 at Chandler, Ariz. Committee chairmen, reporting on 1960 results and the outlook for the decade, declared that the industry's prospects have never looked brighter.

Water-repellent vermiculite masonry wall insulation is proving to be extraordinarily successful. An end-of-the-year survey of institute members throughout the United States and Canada showed that vermiculite fireproofing sales during 1960 were generally good. This business is expected to show another increase in 1961. Substantial gains were made in vermiculite concrete aggregate and acoustical plastic.

L. J. Venard of Minneapolis, Minn., was elected to the presidency, to succeed L. G. McDiarmaid of Vancouver, B. C., and R. W. Sterrett of Chicago was named treasurer. Edward R. Murphy continues as managing director.

Two new directors are L. K. Irvine of Salt Lake City, Utah, and C. E. Goyer of Montreal, Que. Hold-over directors, in addition to Mr. Venard, are R. W. Sterrett and C. H. Wendel of Los Angeles.

H. W. Steiff, chairman of the insulation committee, attributed the large increase in sales of water-repellent vermiculite masonry fill to energetic promotion by the industry and to the unique qualities of the material. Builders describe it as a great advance in insulation, and the Federal Housing Administration announced acceptance of the fill for national use, he stated. It is also widely used for sound-deadening block partitions.

Older houses continue to provide a good outlet for vermiculite loose-fill insulation, Mr. Steiff reported. A recent government survey shows that some 37 million homes across the nation are now more than 20 years old. Few, if any, are adequately insulated, by today's standards; and the easiest way to up-grade attic insulation is to pour 3 in. of vermiculite loose-fill over the existing material.

Reporting for the concrete committee, C. R. Babb of Atlanta, Ga., said that 45,000,000 sq. ft. of vermiculite concrete roof decks were applied during 1960. In the last few years some of the largest decks in the nation have been vermiculite concrete; and two, at least, totaled 1,000,000 sq. ft. each, he stated. To maintain uniformly high quality in vermiculite concrete decks, member companies of the institute are adopting a new inspection plan and a certification program for vermiculite concrete applicators.

(*Concluded on page* 179)

These producers attended the 20th annual meeting of the Vermiculite Institute in Chandler, Ariz.

DEPOSIT IN THE DESERT

New aggregates plant supplies Las Vegas ready-mix plant needs

By HARRY F. UTLEY

BUSTLING, booming, building! That's Las Vegas, Nev. The sprawling desert metropolis continues to grow at a feverish rate, spreading outward into the cactus and chaparral, as well as upward, as new multistory hotels and swank casinos rise into the blue Nevada sky.

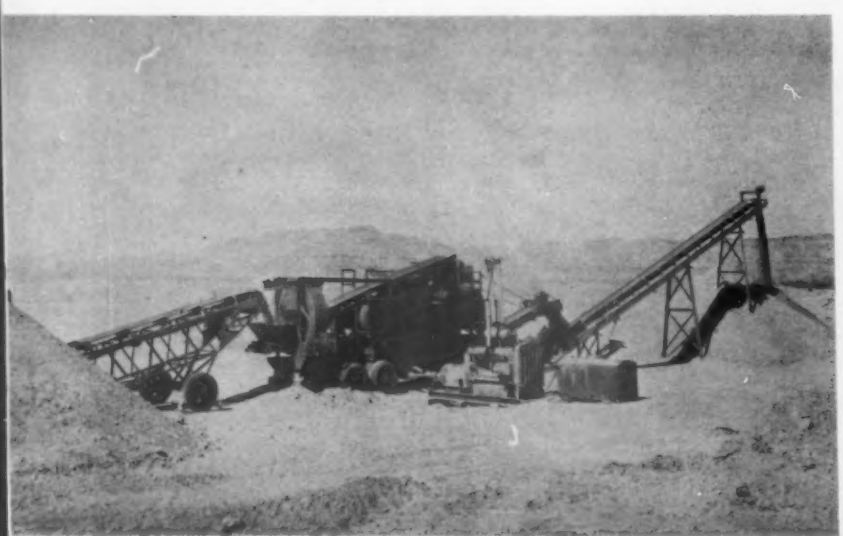
It has been said that, percentage-wise, more concrete is utilized for construction in Las Vegas than in any other American city. This demand has helped W.M.K. Transit Mix, Inc., and its aggregate-producing affiliate, Desert Rock & Sand, Inc., to grow and prosper.

W.M.K. has been furnishing Las Vegas builders with ready mixed concrete for the last eight years and is now the leading supplier in the community and its environs. Beginning with a pair of truck-mixers, its fleet increased until today it includes 20 new 7-cu. yd. Smith units. Its main concrete preparation plant is currently supplemented by three portable batch plants—two Noble Mobile units and a Noble Batch-A-Bout—permitting the firm to win contracts to furnish concrete in areas far afield from the Las Vegas home base.

Until a year ago, W.M.K. was strictly and solely in the ready-mix business, buying its aggregates from various small suppliers. Seeking a controlled source of supply, both for quantity and quality, the three owner-partners, J. W. Wells, A. H. McColley, and B. F. Kraft, in 1959 set up Desert Rock & Sand, Inc., as a separate corporate entity.

Exploration revealed an excellent, well-graded deposit in a desert wash about 5 miles northwest of Las Vegas. After the land had been leased, a vast 1,700-acre tract, a plant was erected and a pit opened up. The new plant has a capacity of 250 t.p.h. of washed and sized concrete aggregates, and practically all of this is now marketed in the form of W.M.K. ready-mix.

A DW20 tractor-dozer and a 4-cu. yd. Michigan tractor shovel are used to strip and excavate the material. The pit-run is loaded into Euclid trucks for transport to the 30-cu. yd. plant hopper. The haul



The company's new portable plant is used primarily to make road material. The 185-hp. diesel engine alongside supplies the power.

Above: This view of the new Desert Rock plant near Las Vegas, Nev., shows the raw surge pile (right), the primary screening and crushing station (center), and the gravel washing and sizing screen over the 3-compartment truck-loading bin (left).

Right: Ben F. Kraft and A. H. McColley, two of the three owner-partners in the ventures, manage and operate the business.

is short—usually about ¼ mile, and never exceeding 1 mile.

From the hopper, a 30-in. by 75-ft. inclined belt conveyor builds up a 15,000-ton raw surge pile. This conveyor and several others which tie the plant together were supplied by Stephens-Adamson from its western factory in Los Angeles. A 24-in. by 75-ft. reclaim belt operates out of a tunnel beneath the pile to deliver to a splitter box which divides the feed to a pair of 6- by 12-ft. Telsmith triple-deck screens. Operating dry, these screens serve to scalp off oversize and take out the sand. The largest screen openings are 1½ in.; the smallest, 8 mesh.

In closed circuit with one or the other of the screens are three crushers. One is a 36-in. Telsmith Gyrasphere, another a 24-in. Gyrasphere, and the third a set of 30- by 26-in. Telsmith smooth rolls. These reduction units can be cut in or out as required to make crushed fractions, the rolls normally being used to make sand from minus ½-in.gravel. Both concrete and No. 8 plaster sands are produced. A Telsmith wet-classifying tank followed by a Telsmith 30-in. single-screw dewaterer makes the sand products from the dry-screen throughs.

Coarse aggregates—normally in three finished sizes: 1½ to ¾ in.; ¾ in. to ⅜ in.; and ⅜ in. to 4 mesh

Below: These three crushers at ground level are in closed circuit with a pair of dry-operated screens located high above. The return belt and waste flume are in the foreground.

—are spray-washed and sized on another 6- by 12-ft. Telsmith triple-deck screen. All screens in the plant are identical for interchangeability.

The washed and sized gravels are stored in a 3-compartment truck-loading bin, surplus being stockpiled in the open. The sands are stockpiled in radial storage piles for drainage. Four Michigan tractor-shovels, including the 4-cu. yd. unit in the pit, are used about the plant property for loading trucks from stockpiles, for clean-up, etc.

Water for washing the aggregates is pumped at 400 g.p.m. from a 300-ft. well by a 30-hp. Fairbanks-Morse pump. The direct supply from the well is augmented by drawing upon a reservoir which is kept full by this pump, which operates during the night. Water is always a precious commodity in the arid Southwest, but the system employed here has proved to be quite adequate so far.

In the spring of 1960, the company purchased a Lima Austin-Western Model 201-E portable crushing-and-screening plant, primarily for the production of road material. The portable unit has been set up separately from the permanent plant on the desert deposit. It is fed by a Koehring belt-feeder and is powered by a 185-hp. Murphy diesel engine. The portable plant incorporates both jaw and roll crushers. A separate Eagle Iron Works screw-classifier may be set up alongside to process sand. if desired. The portable equipment may be moved from time to time to service highway jobs in Nevada, Arizona, and California.

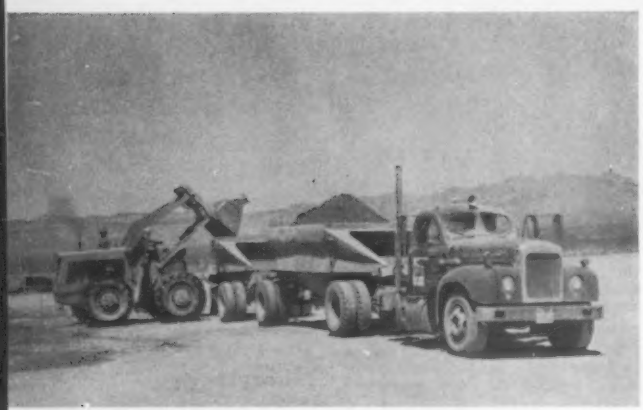
Delivery of aggregates from the new desert plant to a job site, or to the W.M.K. Transit-Mix plant is downtown Las Vegas is by a fleet of Mack diesel tractors with Fruehauf bottom-dump trailer units, each carrying the maximum legal payload of 22 tons.

A new scalehouse erected at the aggregates plant incorporates Fairbanks weighing components. It has a 70-ft. platform to accommodate the long over-the-road rigs.

The W.M.K. batch plant in Las Vegas is a fully automatic Johnson setup with a 4-compartment 250-ton overhead aggregate bin. Cement is stored in an 800-bbl. silo alongside.

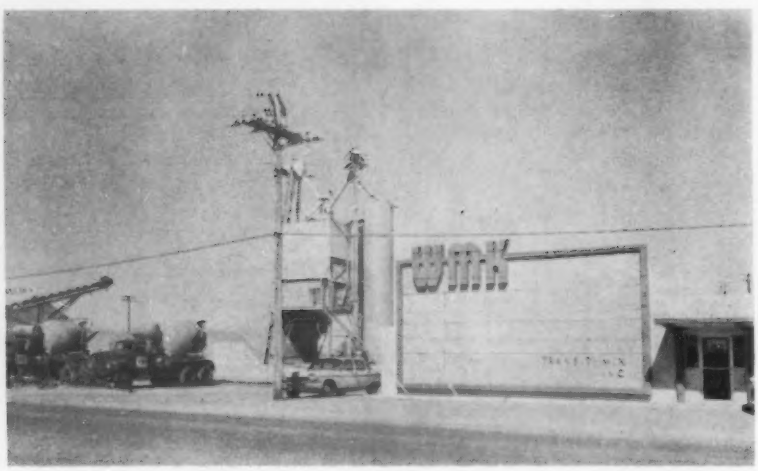
Surplus aggregates stored in piles near the W.M.K. plant are carried by bucket elevator up to the batch-plant bin, with a turnhead and swivel chute to divert them to the proper compartment.

This arrangement is about to be replaced with a row of 22- by 30-ft. concrete storage silos with a reclaiming belt conveyor running through a tunnel at the bottom to deliver the aggregates up to the main bin over the batch plant. Diversion will be by shuttle.



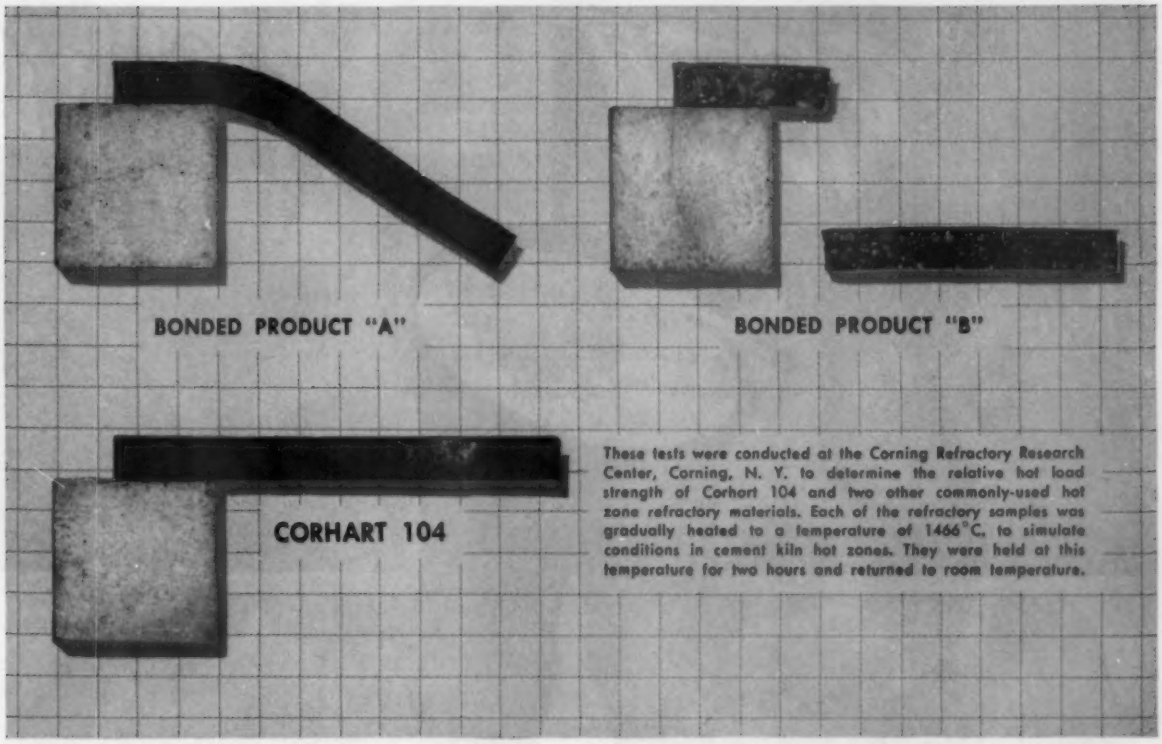
Left: One of the 22-ton dual trailer delivery units being loaded from stockpiles by a tractor-shovel.

Below: The W.M.K. batch plant and new office building in Las Vegas. At the left are two truck-mixers of the 20-unit fleet.



This closeup shows another truck being loaded by one of the four tractor-shovels used in the stockpile area.

CORHART PROVES IT IN THE HOT SPOTS!


BONDED PRODUCT "A"
BONDED PRODUCT "B"
CORHART 104
These tests were conducted at the Corning Refractory Research Center, Corning, N. Y. to determine the relative hot load strength of Corhart 104 and two other commonly-used hot zone refractory materials. Each of the refractory samples was gradually heated to a temperature of 1466°C. to simulate conditions in cement kiln hot zones. They were held at this temperature for two hours and returned to room temperature.

CORHART 104 HOT LOAD STRENGTH halts premature ring failures!

MANY leading cement producers are substantially increasing kiln output by utilizing Corhart 104 as their hot zone refractory. Its extremely high hot load strength (see above) is one of the primary properties responsible for helping eliminate costly premature repair shutdowns.

Corhart 104 is manufactured by an exclusive fusion cast process which creates a strong, non-porous interlocking crystalline ceramic structure. It is electrically-melted at temperatures exceeding 4500° F., giving it a built-in 1000°F. "margin for error." The high hot load strength of Corhart 104 gives you a stable refractory unaffected at temperatures where conventional basic refractories begin to soften.

High hot load strength is only one of *many* Corhart 104 properties responsible for its superior resistance to the abuse of thermal cycling, sustained high temperatures and abrasion in the most severe wear areas of cement kilns. As a result, Corhart 104 consistently outlasts other hot zone refractories by at least 2-to-1.

A Corhart engineer will be glad to help you better utilize conventional refractories in a Corhart "Balanced Lining." Corhart Refractories Company, Incorporated, 946 Commonwealth Bldg., Louisville 2, Ky.

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Vermiculite Meeting

(*Concluded from page* 173)

L. C. Quick, guest speaker, who is technical supervisor for the Barrett Division, Allied Chemical & Dye Corporation of New York City, discussed the application of built-up roofing over vermiculite concrete decks. He also described a newly developed felt, known as a "coated base sheet," that is coated with asphalt on both sides at the factory. This sheeting eliminates the hazard of moisture absorption into saturated felts. Roof decks should be designed to provide prompt drainage to outlets, Mr. Quick stated. The roofing industry recommends the minimum slope of ⅛ in. to 1 ft. and placement of roof drains at the low point in the deck. These fundamental requirements are often overlooked.

The delegates made a field trip in the Phoenix area to inspect a new low-cost vermiculite concrete Bermuda roof that is very competitive with the wood shakes used locally. The party also saw a demonstration of a device for making holes quickly and economically in existing concrete block walls, so that they could be insulated with vermiculite masonry fill.

A. W. Dambros, chairman of the plaster committee, reviewed the institute's fire-testing program, which continues this year. Recent fire tests at Underwriters' Laboratories of new formulas of vermiculite Type-MK fireproofing resulted in four-hour ratings. (Actually, the tests ran five hours before failure.) The new ratings open new opportunities in one-story buildings, Mr. Dambros said.

Large tonnages of vermiculite are being used for conditioning fertilizers and in mosquito abatement programs, according to A. E. Wise, chairman of the agricultural committee. This year, field testing in mosquito control will be done with vermiculite as a carrier of granular DDT and Paris green in five new states: Georgia, Washington, Virginia, Delaware, and New Jersey. Similar work is being done in other states and will continue for several years.

A long-term soil conditioning study at Penn State University is being sponsored by institute member companies. A new fertilizer conditioner has been developed. One cubic foot of the new material will condition a ton of soft goods. A new rose mulch made available last year is finding a good market.

Two new members were voted into the institute: Cleveland Gypsum Company of Cleveland, Ohio, and Tennessee Zonolite Company of Nashville, Tenn.

A guest speaker, Don Henshaw of MacLaren Advertising Co., Ltd., Toronto, Ont., discussed the national character of the Canadian people and trade relations between Canada and United States.

A.I.M.E. Meeting

(*Continued from page* 91)

crete channel sections resting on precast bents, which are set on pound-in-place footings. The conveyor passes over two railroads and several country roads. It follows the contours of the countryside.

Actual installed cost of the conveyor system was $3,524,079. It is operated and maintained by two men and a supervisor, and supplies limestone and shale on the basis of an 8-hour day 5 days per week, for the annual production of 5,250,000 bbl. of cement. This production requires 1,820,000 tons of limestone and shale. Ideal Cement management is very well pleased with the performance of the conveyor.

Alfred A. Roetzer, general manager of packaging services for St. Regis Paper Company, presented a paper covering *Materials Handling, Transportation, and What Lies Ahead in Packaging in the Cement Industry*. He stated that increases in truck shipments of cement and the demand for palletized loads present new problems in packaging and indicated that changes were due in ways of marketing bagged cement. Attempts at palletizing truck shipments using existing packing and loading facilities rarely turned out satisfactorily. A study and analysis of possible requirements in packing and loading in the next five years showed that new methods and new facilities were needed.

As a result, the following innovations were put into effect—auto-

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Always Specify Firestone Tires When Ordering New Equipment.

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- ☐ Why are Eaton 2-Speeds better than other axles?

Probably everybody who owns, operates, or maintains trucks knows that an Eaton 2-Speed Axle doubles the number of gear ratios provided by a conventional transmission—that it gives drivers the *right* ratio for every operating condition.

You may *not* know just how doubling the the number of available gear ratios effects big savings in operating and maintenance costs; enables trucks to make more and quicker full-load trips; cuts wear and tear on engines and all power transmitting units; adds thousands of miles to vehicle life; and makes trucks worth more when traded in.

If trucks are part of your business, you'll want to know *exactly* why Eaton 2-Speed Axles will save you money. Ask your truck dealer to give you the answers.

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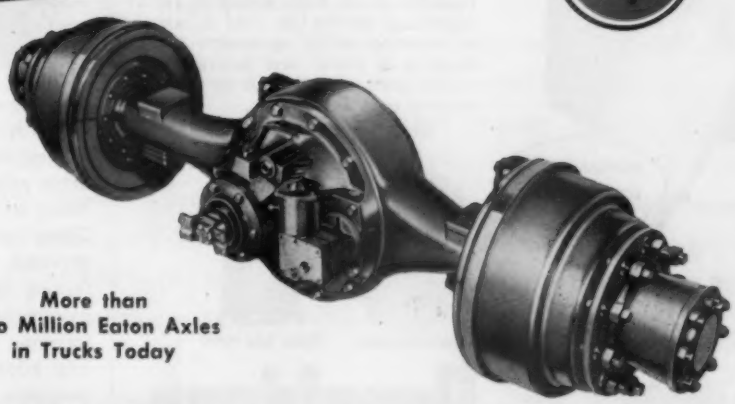

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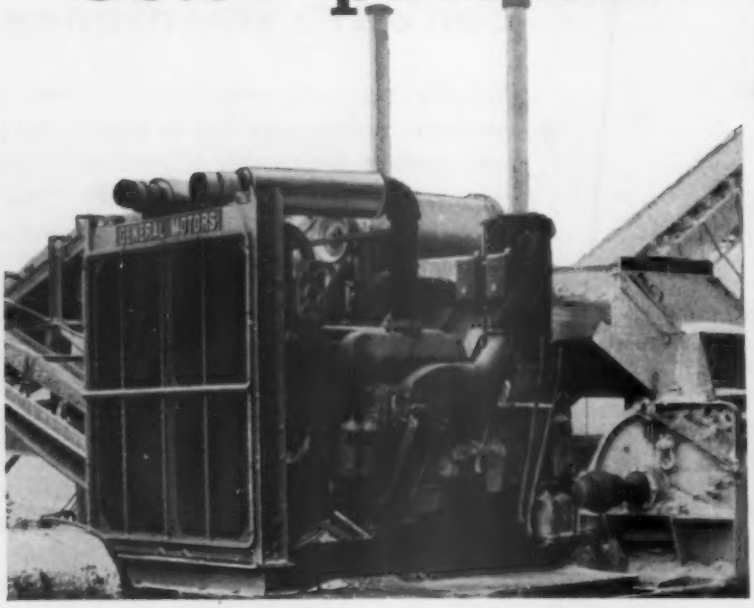
Donaclones deliver 99.9% pure air!



Now factory equipment on many leading makes of engines

Dust gets so thick around this ag limestone plant, it often hides the equipment. Diesel engines on crusher and hammermill used to require frequent overhaul with expensive downtime.

After Donaclones were installed, engines were operated according to the previous overhaul schedule and then examined. *They showed practically no signs of wear.*

The Donaclone's primary centrifugal cleaner removes 98% of the dust. Only 2% remains for the Duralife paper filter giving it an extra-long service life. And it can be renewed when necessary, by dunking in water and detergent.

Add years of engine life by modernizing with Donaclones.

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Side inlet model

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matic palletizing of filled bags at the maximum rate at which they come from the packer, a warehouse in which the pallet loads can be stored awaiting shipment, and the use of a truck-loading terminal for quick loading at any time by a minimum crew. Obviously these innovations alone add to production costs, which have already been rising; but combined with other new ideas, they provide a more economical operation than heretofore.

Two new ideas in automation which complete the circle of mechanization are automatic checkweighing and automatic placing of the empty valve bags in the packing machine. These new facilities, where already installed, have resulted in better inventory control, less spilling and breakage, fewer customer complaints, shorter time of truck loading and unloading, and better safety.

Conflicting Interests and Zoning Five papers were presented on this subject. It was agreed that withdrawal of land from mining in order to permit city growth, the building of highways, the establishment of green belts and parks, military camps and ranges, and water reservoirs is being done in many instances without consideration of mineral resources, thereby crowding out of existence many producers of clay, stone, sand, and gravel.

These low-cost commodities have to be obtained near urban centers, if possible, in order to supply the markets economically. Often the conflict between the various interests could be resolved by careful planning and zoning; hence, the need for long-range planning was urged. There is also a great need for information on the mineral resources of areas adjacent to cities and in areas being set aside for various purposes. There is an opportunity for a compromise that will permit the obtaining of minerals and materials essential to the economy without interfering with urban growth or setting aside land for parks and other purposes. Too little attention has been paid in the past to the proper exploitation of mineral lands near cities.

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REO TANDEMS . . . the talk of the transit mix business

Word gets around fast. Reo's rear axles can haul more payload—legally—because of lower rear chassis weight and unique front axle placement. You get another 400 to 600 lbs. of payload capacity with Reo's low cost, ***flywheel power take-off***—installed as an integral part of the chassis engine drive. But that's not all. Reo's ***Gold Comet*** engine goes the life of the truck without cylinder re-boring or block replacement—thanks to exclusive "wet sleeve" construction. ***ReoMatic transmission***—fully proved, fully automatic—helps speed delivery schedules by eliminating power interruption and gear shift guesswork; prevents harmful engine lugging, too, and minimizes the chance of drive line damage. Better get the complete Reo story before you buy.

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Modern Cement Plant at Midlothian, Texas — designed *for Maximum Efficiency . . . low-cost Operation!*

At Turnbull, we feel that cement plant design involves economy of operation as well as the original capital outlay. The cost of building the new plant for Texas Industries, Inc. was significantly below that of comparable plants recently built in other areas — *And operating costs are below original projections!*

A Turnbull engineered cement plant for Mindanao Portland Cement Corporation, Illigan City, Philippines is under construction. With all quarry, process and other equipment purchased and all construction contracts awarded the overall cost is well within the original estimated cost.

When next you are planning expansion or modernization programs for cement or other nonmetallic processing facilities, *turn to Turnbull.* Your inquiry will receive the immediate attention of our well-qualified and experienced design and engineering group.

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CLEVELAND — DALLAS — WASHINGTON, D. C.

New Haven Trap Rock Men Form New Wise Owl Club

At the New Haven (Conn.) Trap Rock Company's plant, the newest chapter of the Wise Owl Club of America was organized recently. This is an organization including industrial employees and technical students who have escaped eye injury or loss of vision because they were wearing safety eye-wear on the job in the laboratory or shop when an accident occurred.

The Wise Owl Club plan, sponsored by the National Society for the Prevention of Blindness, is an educational tool designed to reduce the annual toll of 300,000 eye injuries in industry. The club now has more than 21,475 members, representing a compensation saving in excess of $105 million. The N.S.P.B. is the only national voluntary health agency engaged in the prevention of blindness through a total program of research, service, and education.

Nonmetals producers were well represented among the winners of citations presented recently at the annual awards dinner of the Zanesville (Ohio) Safety Council. Firms receiving honors for having no lost-time accidents during 1960 included the Ayers Mineral Company, The Columbia Cement Company, Muskingham River Gravel Company, and the Millwood Sand Company.

Central Texas Gravel Company won the Waco area industrial safety contest for the last year and received a Certificate of Merit. The award was made at the 22nd annual Texas Safety Conference and Governor's Highway Safety Conference in Houston.

For having operated its quarry at Allentown, Pa., for 12 years without a disabling work injury (900,000 accident-free man-hours), the Coplay Cement Manufacturing Company was cited recently by the Pennsylvania Manufacturers' Association Casualty Insurance Company. The cement company was presented with a Certificate of Merit for this outstanding record.

Obituaries

H. M. Krabbe

H. MOGENS KRABBE, works manager at Permanente Cement Company's plant at Bellingham, Wash., died on March 17.

Mr. Krabbe held engineering positions involved in the construction or operation of cement plants throughout the eastern states. In 1932 he became assistant superintendent and plant engineer of The Olympic Portland Cement Company, Limited. He succeeded to the post of works manager upon the retirement of his father, Adolph Krabbe, in 1948, and remained in that position after the purchase of the Olympic firm by Permanente in 1958.

WILLIAM B. CHEEK, 73, retired civil engineer and a former manager of the Western Portland Cement Association, died recently in Colorado, where he had lived for the last 43 years. He had been formerly associated with the Monolith Portland Cement Company, Los Angeles, Calif., and later was president and general manager of Vol-Scor Aggregate Company.

JOHN KENDRICK, program specialist of the Missouri ASC, Columbia, Mo., died unexpectedly in February after having suffered several heart seizures. He had long been active in state limestone producer circles.

CHARLES T. ALEN, 89, retired superintendent of Carthage Limestone Company, Carthage, Mo., died early in March in his home after a heart attack.

Put
BIG FOOTAGE
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on every shift with Brunner & Lay drilling tools. Carbide Rok-Bits on Brunner & Lay rods give longer feeds, fewer bit changes, straight ROUND, easy-to-load holes that increase blasting efficiency. All threads, all popular sizes, job fitted carbides to meet your exact needs. Proved on every type machine and job. Brunner & Lay, Inc., 9300 W. King St., Franklin Park, Ill. Plants & conversion shops from coast-to-coast.

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carbide ROK-BITS • DRILL RODS • INTRASET STEEL COUPLINGS, ADAPTERS, EXTENSION STEEL, STRIKING BARS. MOIL POINTS, CLAY SPADES, ASPHALT CUTTERS, etc.

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STANDARDIZE ON THE "PAIR FOR WEAR" for hardfacing and manganese welding

There's no need to "buy the catalog" when the "Pair for Wear" can handle 90% of your build-up and hardfacing work. Use the "Pair for Wear" wherever you need high impact and abrasion resistance. *Standardize* on them.

But *test* them first, and see how the "Pair for Wear" get their reputation for handling ease, usability, fast deposit and good-looking bead. See if the "Pair for Wear" doesn't give you *the best results you've ever had.* Write us now for technical bulletin and test samples of rods.

Available in 50 lb. standard manual packages and 50 lb. semi-automatic coils.

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American Manganese Steel Division • Chicago Heights, Ill.

"Buy Through Your Local Welding Supply Distributor"

Other plants in: Denver • Los Angeles • New Castle, Delaware • Oakland, California • St. Louis

Welding products distributed in Canada by Canadian Liquid Air Co., Ltd.

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LUTHER G. MCCONNELL, 75, retired vice-president of Lone Star Cement Company, died recently. He joined Acme Cement Co., Catskill, N. Y., in 1922; Acme was subsequently purchased by North American Cement Company, and Mr. McConnell was later appointed vice-president. After being engaged for a short period in banking, he returned to the cement industry in 1929 as general manager of the Cement Institute, New York. He joined Lone Star in 1931, and retired in 1956.

JAMES C. MCINTOSH, 62, former owner of the Binghamton Crushed Stone & Gravel Company, Inc., and of the McIntosh Transit Mix Concrete Company, Inc., both of Binghamton, N. Y., died recently in that city.

WILLIAM J. FOGLE, 54, superintenent of the rock, sand and gravel plant of Hartman Concrete Materials Company, Bakerfield, Calif., died recently after a heart attack. He joined the firm in 1950; prior to that, he had been with Kern Rock Company, also of that city.

Pennsylvania Stone Producers Name J. F. Coleman President

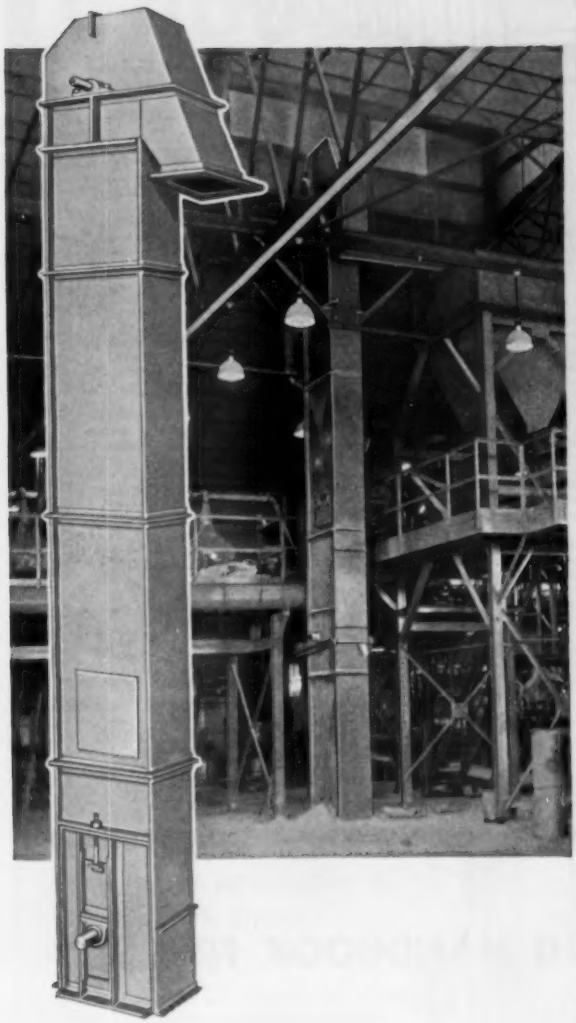
At the recent annual business meeting of the Pennsylvania Stone Producers Association, held on February 2 in Harrisburg, the following slate of officers and directors was accepted for the ensuing year:

J. Fred Coleman Jr., president; David K. Shroyer, vice-president; H. M. Binkley, treasurer; and Earl J. Breneman, secretary. The following were elected directors: Herbert R. Imbt and Charles Z. McGinley, eastern section; Paul E. White and J. Allen Heim, central section; and Lewis M. Nauss and Wilmer P. Eidemiller, western section.

Plans have been made for the first International Instrument-Automation Conference and exhibit, to be held in Toronto's Royal York Hotel from June 5 to 8, 1961. Sessions will cover measurements, data processing, and automatic control.

EHRSAM® for continuous

LOADABILITY!



Engineers who specify conveying systems today demand quality – equipment proven to speed processing and maintain continuous material flow. They look beyond price to design and craftsmanship. An Ehrsam bucket elevator adapts to existing equipment for easy installation. Dramatically increases productivity. Ehrsam frees you from critical design and fabrication costs and bears the responsibility for efficient operation throughout its useful life. Behind quality is management's "no-orphan" policy . . . Ehrsam refuses to abandon one piece of equipment in productive use. Ehrsam supplies a wide range of products to fit your material flow pattern . . . at your desired pace . . . for increased profits. Call one of the seven district offices below for complete information.

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ACME SCREENS ARE MADE STRONGER TO LAST LONGER

Sand and gravel producers! Rock plant owners! Acme wire screens are woven from the finest materials available to resist abrasion and wear . . . important to you because Acme screens last longer . . . cut screen replacement costs and increase profits.

Acme screens are precisely crimped for weaving into exact spacing. No irregular openings to slow the flow of material.

Acme wire screens are available in Arch, Smoothtop and Double crimp. Perforated plate screens are also available.

Acme Smoothtop screens are recommended when smooth surfaces are required. Longer service is provided with Acme Smoothtop screens due to less friction caused by material passing over the screen.

EDGE TYPES

Acme screens are prepared with any edge preparation to meet your requirements including hooked or shrouded edges.

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MANUFACTURERS OF INGRAM ROLLERS

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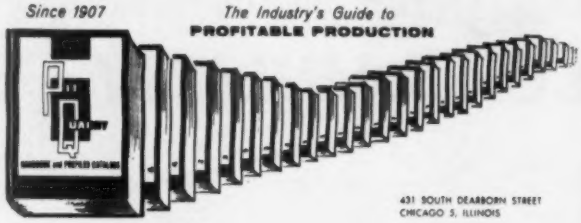
NOTICE

TO THE TOP EXECUTIVE IN EVERY NONMETALLIC MINERAL PRODUCING COMPANY

You probably received this letter in the mail . . . the response has been overwhelming . . . the demand for the Handbook is sure to exceed the supply.

Since 1907 *The Industry's Guide to* **PROFITABLE PRODUCTION**



431 SOUTH DEARBORN STREET
CHICAGO 5, ILLINOIS

We are in the process of compiling our mailing list of those men who will receive a complimentary copy of the 1961 Pit & Quarry Handbook and Pre-filed Catalog.

In order to be sure of covering every important executive, both administrative and production, I am asking your help. We would like your recommendations as to whom, in your company, we should send a complimentary copy of the Handbook. These recommendations do not place you, your company or the men recommended under any obligation. The Handbooks are sent with our compliments.

Here is a book the key administrative and production executives in your company can use. Containing approximately 1,000 pages, the Handbook covers every phase of operating a plant in the SAND, GRAVEL, CRUSHED STONE, CEMENT, LIME, GYPSUM AND OTHER INDUSTRIAL MINERALS INDUSTRIES from Prospecting and Evaluating Nonmetallic Mineral Deposits to Equipment Maintenance. Also the leading manufacturers of equipment for the industry have complete information on their products.

Primarily, we are interested in sending a copy to the Superintendent (or comparable position) in your plant and a copy for the top administrative executive plus a copy to the executive in charge of purchasing. Also your top engineer should be given consideration. Should your company operate more than one plant, be sure to include the name of the superintendent in each plant. Also, it is imperative that the title of each individual to whom you wish us to send a Handbook is included. We suggest you list the names in the order of importance for receiving the Handbook. This suggestion is made should the demand exceed our supply.

Although the Handbook will not be ready for distribution for several weeks, we must have this information now in order to compile the mailing list and also to help in estimating the number of copies to be printed.

We will do everything possible to send copies to every individual that you request but by necessity we must reserve the right to limit distribution.

Thank you very much for your cooperation and I will appreciate your taking care of this matter at your earliest convenience.

Sincerely yours,

Robert L. Rudd
Manager Industrial Relations

RLR:fd

LAST CHANCE TO GET A $20 HANDBOOK FREE.

Hundreds of companies have responded to this letter and practically all distribution of the 1961 HANDBOOK will be based on these recommendations.

Complimentary distribution is limited to producers of nonmetallic minerals. Titles of each individual as well as products produced by your company must be included with your recommendations.

After publication the cost of the Handbook is $20 per copy. Send your recommendations today to get free copies for your key personnel.

PIT AND QUARRY HANDBOOK

431 So. Dearborn St. Chicago 5, Illinois

TROJAN TL-565

All Trojan explosives three inches and smaller in diameter are packed in polyethylene bag-lined cases.

economical, cap-sensitive 40% cartridge strength explosive producing excellent results in limestone. Good fume characteristics. Perforated cartridges permit easy tamping without slitting. 1¼"—1½"—1¾" for use underground; 2"—2½" and larger for open pit work.

New bulletin #101 upon request

TROJAN EXPLOSIVES

- HIGH EXPLOSIVES
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- SEISMIC EXPLOSIVES
- PERMISSIBLES
- CUSTOM-DEVELOPED EXPLOSIVES TO MEET SPECIAL REQUIREMENTS
- BLASTING SUPPLIES

TROJAN POWDER COMPANY*

17 North 7th St., Allentown, Pa. *Sales Offices:* Allentown, Pa., San Francisco and Los Angeles, Calif., Portland, Ore., Kansas City, Mo., Wolf Lake, Ill. *Distributing Magazines in principal consumer districts.*

TROJAN *Explosives*

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NEW!

Combination

ROTARY-PERCUSSION AIR DRILL

Features:

1. Operates as conventional rotary air drill or as down-the-hole air hammer that can run drag bit or percussion bit.
2. All-hydraulic drive.
3. Completely self-contained . . . tractor engine, all components.
4. Variable speed controls on pull-down and hoist.
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Carey MACHINE & SUPPLY INC.

P. O. Box 63 Houston 1, Texas

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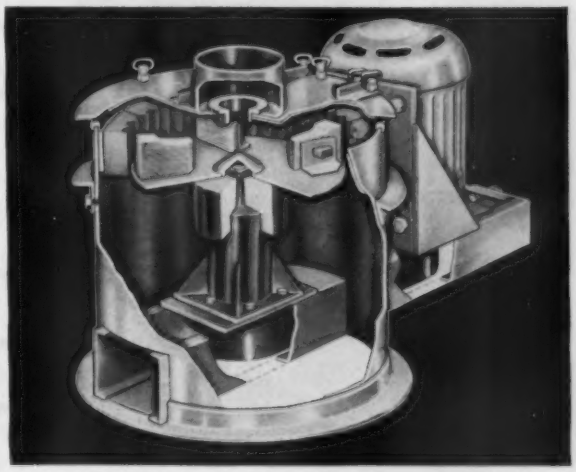
HAVE YOU CHECKED THE NEW, BETTER WAY TO CRUSH?

enthusiastic users say the

TORNADO

SQUARE IMPACT CRUSHER

turns out a dense graded cubical product—yet it is the most versatile crusher ever put on the market. Produces any range of crushing, to screen



to any gradation required, in an almost unbelievable number of tons per hour, and does it at less cost than Rod Mills or other types of Crushers priced up to TEN TIMES AS MUCH!

Virtually no "down time"—you can keep it in operation 22½ hours a day, 7 days a week, year after year.

Light in weight—requires no massive foundation and little head room. Power requirement amazingly low. No zincing or babbitting needed.

Write, wire, or phone collect for details. We'll run a sample of your own material through the Tornado to PROVE how much it will do for you.

WERCO Steel Company

2151 East 83rd Street, Chicago 17, Ill.
Phone ESsex 5-8446
Cable Address, IMPACTOR

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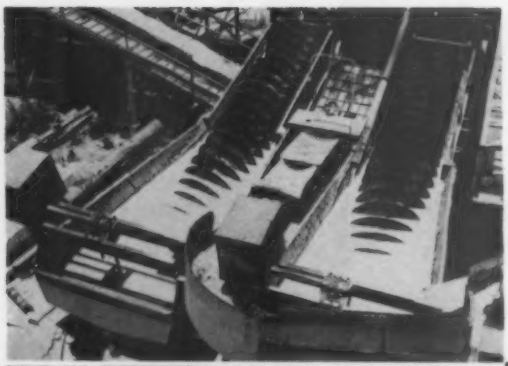
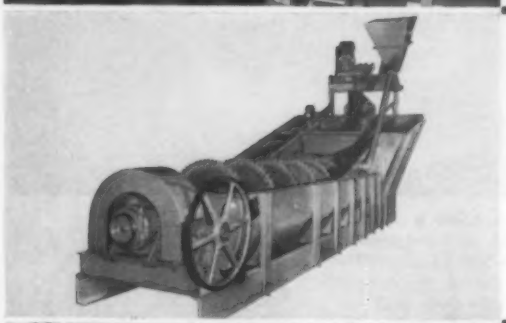
4 ways to make more money



Marcy CPD Rod Mills, Akins Sand Classifiers, Akins Separators, and Marcy Scrubbers were developed for the stone products industry. They are being used by many producers to increase profits by decreasing costs; and by increasing markets through preparation of better products and a wider range of products.

1 Washing and Classifying with Akins Classifiers. With the Akins Classifier you can wash, deslime, dewater, and *remove or save* sand sizes as desired. A large *working* pool area in a classifier is required to do this work...The Akins gives you more working pool area per dollar.

2 Grinding with Marcy CPD Rod Mills. Grinding stone or waste pea gravel in a Marcy Mill results in a superior, cubical product for blending to meet the most rigid specifications. Marcys have kept many small operators in business; and, have been used on almost all large government dam jobs.



3 Separating with Akins Heavy Media Separators. Many deposits can be most efficiently treated by the Akins heavy media process. The Akins' large *working* pool area permits close control of products from feed of variable quality or quantity. Reduced media recirculation in the Akins results in lower total horsepower required.

4 Scrubbing with Marcy Heavy Duty Scrubbers. Thorough, efficient removal of clay from sand can be accomplished with Marcy Scrubbers. The Marcy principle of small diameter, long length scrubbers gives longer retention time, more contact for scrubbing, less short-circuiting, and lower horsepower...a principle which has been proven on difficult washing of iron ore.

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Licensed Manufacturers and Sales Agents in Canada, Australia, Sweden, England, South Africa
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Industry Personalities

HENRY A. BEDNARSKI has been appointed sales engineer, furnace products division of Basic Incorporated, in the most recent expansion of the firm's engineering service to its refractory customers.

B. M. Brabant

B. M. BRABANT has been appointed vice-president and general manager of British Columbia Cement Company, Ltd., Vancouver, B. C. He has also been appointed vice-president and a director of the parent organization, Ocean Cement and Supplies Ltd., and a director of Evans, Coleman and Evans Ltd., and of Evans, Coleman and Gilley Bros. Ltd. He succeeds B. FRANKLIN COX, who has returned to England to assume a post with the Associated Portland Cement Manufacturers Ltd.

BLAINE E. MILLER has been promoted from the post of Michigan division manager of Huron Portland Cement Company to that of assistant general sales manager.

SHERMAN LOCKE has been named to the newly created post of district manager in Sacramento, Calif., for Calaveras Cement Company, a division of The Flintkote Company. BERNARD DE ROSE has succeeded him in Oakland.

DON SCHWOCHO, formerly with U. S. Gypsum Company, has been appointed sales representative in Fresno to fill an opening created by the transfer of CHARLES LINDGREN to Springfield, Oreg., where Calaveras recently opened a distribution center.

ROBERT M. FISHER has been named sales representative in Modesto, Calif.

H. F. Stepanek

HAROLD F. STEPANEK, secretary - treasurer of Alpha Portland Cement Co., Easton, Pa., has been elected to the company's board of directors. He fills a vacancy left last August by the death of former board chairman and president, John F. Magee.

Mr. Stepanek joined Alpha as assistant to the treasurer in 1952. He became secretary-treasurer in 1959.

F. CURTIS LANE has been elected president of John S. Lane and Son, Incorporated, Meriden, Conn. He succeeds ARTHUR F. EGGLESTON, who was named chairman of the board.

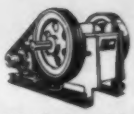
DR. C. F. FOGARTY has been named senior vice-president of Texas Gulf Sulphur Company, New York, N. Y. He has been placed in charge of the company's new $25,000,000 potash project at Cane Creek, Utah, where he continues as head of the company's exploration activities.

HUGH W. STRICKLAND is the new senior vice-president in charge of T.G.S. sulphur production. Both men had previously been vice-presidents of the firm.

BACHMANN G. BEDICHECK has been named senior counsel, and HAROLD B. KLINE is now the company secretary.

WILLIAM L. CAUGHMAN has been appointed sales manager in the Jackson (Miss.) office of Marquette Cement Manufacturing Company. He was formerly assistant to the sales manager. He succeeds HENRY W. GRAUPNER, who has retired after 37 years of sales management service with Marquette.

Laboratory Crushers and Pulverizers

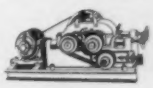


4"x 6" Massco Laboratory Jaw Crusher

Welded steel frame; manganese steel jaw and cheek plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjust for plate wear and product size by convenient hand wheel adjustment.

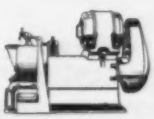
6" and 10" Massco Gy-Roll Reduction Crusher

Reduces ½" feed to as fine as 10 mesh in single pass. High capacity, low power consumption.



Laboratory Crushing Rolls

Sizes (Diameter x width): 10"x 6" and 12"x 8". Adjustable roll space setting up to ¾". V-belt drive. Heavy, cast frame absorbs vibration, results in long life.



Massco-McCool Pulverizers

Disc type grinder with a planetery movement. No gears. Will grind ¼" to 150 mesh in one pass.

Marcy Pulp Density Scale

Gives direct reading of weight; specific gravity of liquids, pulps, and dry solids; percent solids in pulp. Very accurate. Easy to clean.

MINE AND SMELTER SUPPLY CO.

The Company that cares enough to give you the best!

3800 RACE STREET
DENVER, COLORADO

OFFICES AND AGENTS IN PRINCIPAL CITIES

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10 ways Du Pont can help you break more rock per dollar

It's not the cost of loading a hole that counts in quarry blasting . . . it's the cost of getting out a ton of rock.

That's why the really successful quarry men look long and hard for top quality explosives.

And it's why so many of them turn to their Du Pont representative or distributor for a complete choice of quality products . . . to take the guesswork out of every shot.

Have you looked into the advantages of these Du Pont products when used in your operations?

1 DU PONT "NILITE" 101 and 202: New low-priced free-running blasting agents of medium density, ideally suited for dry holes from 2" diameter up. No field mixing; Du Pont quality performance, shot after shot.

2 DU PONT "NITRAMITE" FR: Free-running nitro-carbo-nitrate higher in density than the "Nilite" grades. Can be poured readily into wagon-drill holes as small as 2" in diameter.

3 DU PONT "NITRAMITE" 1 and 2: Quality non-cap-sensitive blasting agents which sell at reduced prices because they come in water-resistant fiber-board tubes instead of metal cans.

4 DU PONT "NITRAMON": The premium quality non-cap-sensitive blasting agent, packed in sealed metal containers to provide maximum water resistance. The ultimate in safety and dependability for modern quarry blasting.

5 NEW DU PONT HDP PRIMERS: High detonation pressure primers in 1-, ½-, and ⅓-pound sizes. Specially made to detonate nitro-carbo-nitrates, "Tovex" gelatin, and prill/oil mixtures.

6 NEW DU PONT "TOVEX": High velocity non-NG gelatin. Gives higher borehole density than most products on the market. Gives excellent results in hard, massive rock.

7 DU PONT DYNAMITES: A complete line of dynamites for every blasting need — each product manufactured to the rigid quality standard demanded at Du Pont.

8 NEW LOW ENERGY DETONATING CORD (LEDC): Greatly reduces noise of blasting. No need to bury trunk lines. 150 feet of LEDC makes no more noise than one electric blasting cap . . . or two inches of "Primacord".

9 DU PONT BLASTING SUPPLIES: A complete line. Blasting caps — Electric blasting caps — MS (Millisecond) Delay and the new "Acudet" Delay Electric Blasting Caps — "Primacord" MS Connectors in three delay intervals.

10 DU PONT BLASTING ACCESSORIES: Push down and condenser discharge blasting machines—Voltohmeters—Rheostats.

Your Du Pont Explosives Department representative or distributor can supply further information or demonstrations of any of these products. Call him. Or write Du Pont, 2446 Nemours Building, Wilmington 98, Del.

Explosives DU PONT

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Better Things for Better Living . . . through Chemistry.

Heat exchange a problem?
Handle more work—more efficiently—
with "HOLO-FLITE"
PROCESSORS

The secret is continuous bulk flow operation — far faster and more efficient than batch processing. Heating or cooling fluid circulates through the hollow shaft and flights of a conveyor screw, thus processing granulars, fluids, or sludges as they flow along. Gentle conveying action minimizes particle degradation and dusting. Broad operating range. Heats to 500°F; cooling range, 1800°F to 0°F. Multiple "Holo-Flite" tiers can be stacked for high capacities in minimum floor space.

FREE LITERATURE. Write today to Western Precipitation, 1000 W. 9th St., Los Angeles 54, Calif. (In Canada, write 8285 Mountain Sights Ave., Montreal, P. Q.)

WESTERN PRECIPITATION
DIVISION OF JOY MANUFACTURING COMPANY

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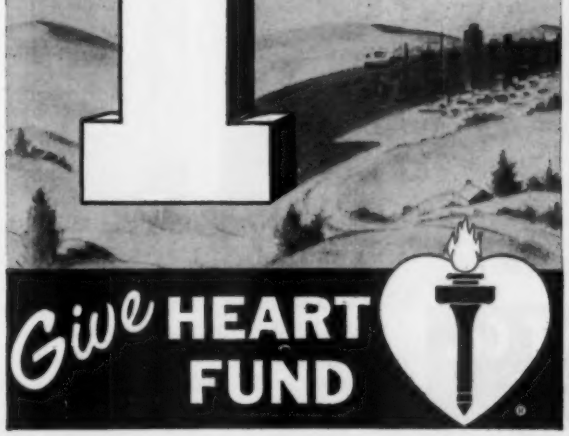
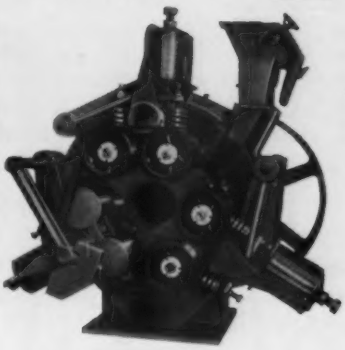
Fight HEART DISEASE
#1 ENEMY



Give HEART FUND

Investigate the New and Improved



SIX-ROLL
KENT ABBÉ MILL

- Six Grinding Rolls instead of three.
- Grinds 8 tons per hour of limestone to a fineness of 97% minus 100 mesh; 10-12 tons per hour of Florida pebble phosphate rock to a fineness of 87% minus 100 mesh.
- Also grinds gypsum, barytes, ores and other friable materials.

Ask for Bulletin K-2.

CRUSHING • GRINDING • PULVERIZING • AIR SEPARATING MACHINERY

KENT MILL DIVISION
abbé ENGINEERING COMPANY
420-0 Lexington Ave., New York 17, N. Y.

Enter 193-B on card, page 217

New HINGED PLATEGRIP

Recommended for mines, quarries, construction work, storage yards—wherever belt length must be frequently changed. Hinged Plategrip Fasteners make a strong, flexible joint in heavy duty conveyor belts, trough naturally, ride smoothly over pulleys, yet can be separated by simply pulling the hinge pin. Improved design takes the new smaller diameter self-lubricating nylon sheathed cable hinge pins. No. X500-1 single bolt fasteners and No. X500-3 3 bolt fasteners (used at outside edges) to reinforce edges and aid troughing.

Write for Catalog

ARMSTRONG-BRAY & CO. 5394 NORTHWEST HIGHWAY CHICAGO, ILLINOIS

Enter 193-C on card, page 217

CONTRACT CORE DRILLING

EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

FOUNDATION TEST BORING

GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

Enter 193-D on card, page 217

L. F. DeRusha has been named to succeed H. H. Zahniser as district representative, slag products, for United States Steel Corporation. A realignment of the department was made to keep pace with increased emphasis on marketing slag products.

Melvin W. Searls has been appointed to the newly created post of merchandising director in the Building Products Division of The Flintkote Company. Thomas J. McDonald has been named to the newly created position of sales director in the division.

Mr. Searls previously was general sales manager, Special Products Division, and Mr. McDonald formerly was assistant to the vice-president, sales.

John Billie has been appointed general sales manager for Keystone Portland Cement Company, New York, N. Y. Edward H. Ward has been named sales manager, and Robert G. Springer is now assistant sales manager of the New York Division.

Charles R. Lorenz Jr. has been appointed assistant to the president of the Potomac Sand and Gravel Company, recently-formed subsidiary of Dravo Corporation in

C. R. Lorenz Jr.

H. V. DeWalt

Washington, D. C. Mr. Lorenz had been manager of the South Side (Pittsburgh) plant of the corporation's Keystone Division since 1958.

H. Verne DeWalt, a salesman in Keystone Division, has been appointed manager of the new South Side plant. He joined Keystone Division in 1938. He became successively a foreman, supervisor, and (in 1946) manager of the division's Neville Island, Aliquippa, and Leetsdale plants.

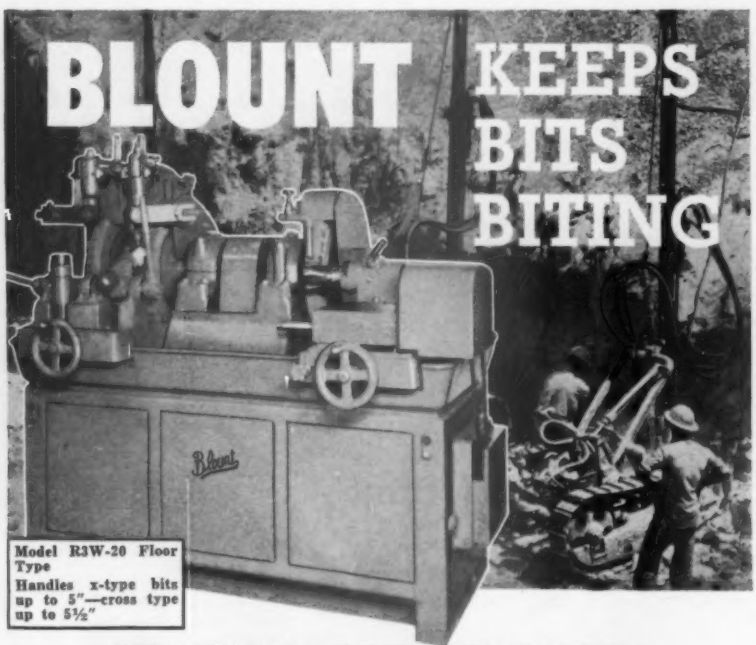
T. W. Richards has been named manager of Bestwall Gypsum Company's plant at Sigurd, Utah. He replaces E. Flinn, retired.

Mr. Flinn has been cited by management as one of the veterans in the gypsum business.

T. W. Richards

E. Flinn

Mr. Richards joined Bestwall in May, 1960, to prepare for his new post. Previously he had wide experience in the field of gypsum production.



DETACHABLE ROCK BIT GRINDER CUTS DOWN-TIME – LENGTHENS BIT-LIFE

Blount machine-sharpens carbide-tipped rock drills far more accurately than any operator, however skilled, can by hand — and up to five times faster!

When you recondition your rock bits on a Blount Grinder, you can be sure of a uniform, symmetrical grinding job, including the exact angles the manufacturer intended.

Put a Blount Grinder to work for you, and get the savings so many customers report!

★ Longer bit-life — more regrinds per bit
★ Faster drilling
★ Reduced drilling upkeep
★ Lower cost per foot of drilling

PARTIAL USER LIST
Blount Bit Grinders:

Merritt Chapman & Scott Corp.
Morrison Knudsen Co.
Shea-Kaiser Morrison
Arch Dam Constructors
Litoria Mining Co.
Quebec Cartier Mining Co.
Jones & Laughlin Steel
Vulcanos do Brazil
National Asbestos Mines, Ltd. (Thetford Mines)
Central Electric do Furnas
Vulcan Materials Co.—Stockbridge Stone Co.

J. G. BLOUNT Co.
Everett 49, Massachusetts
Div. Bowl-Mor Co., Inc.

Enter 194 on card, page 217

Limited Quantities Still Available!

PIT and QUARRY'S

Comprehensive

PORTLAND CEMENT PLANT MAP

Here is all of North America rolled up in a single package to provide the best available source for pinpointing the following information—

- name and location of portland cement producing and distributing plants
- name and location of grinding plants and plants now under construction
- type of process used by each plant
- plant capacities in bbl/year
- brand name of cement produced

This map is big—44 by 34 inches—and printed on extra-heavy paper ideal for framing or pasting. Plant listings are placed alongside the map for easy location and reference.

Order direct from PIT and QUARRY at the following quantity prices—

QUANTITY	PRICE (each)
1-10	1.00
11-25	.75
over 25	.50

Send us your check or money order today, attached to your company letterhead.

PIT and QUARRY *Publications*

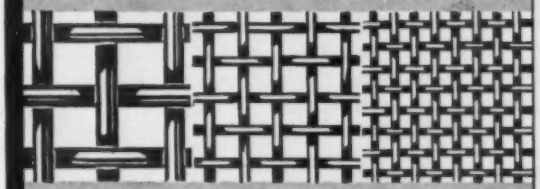
431 S. Dearborn St.

Chicago 5, Ill.

STRONG AS ARMOR

NAT-ALOY

Woven Wire Screens



Reliable Nat-Aloy woven wire cloth is specified throughout industry for maximum screening accuracy and economy. Available in flat surface, lock crimp, double crimp, rectangular and long slot openings. All sizes, meshes and gauges—prompt shipment.

WE OFFER NOW... SUPER NAT-ALOY OIL TEMPERED WOVEN WIRE CLOTH

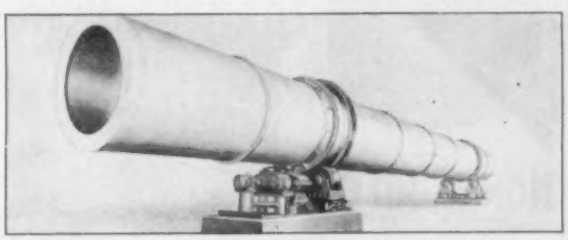
★ GREATER RESISTANCE TO ABRASION
★ MORE TONNAGE AT LOWER COST
★ FEWER COSTLY CHANGE OVERS

Write for information. Also stainless steel wire screens.

NATIONAL WIRE CLOTH COMPANY
252 W. Fairfield Ave., St. Paul 1, Minnesota

Enter 195-A on card, page 217

IF YOU ARE READY FOR A NEW ROTARY KILN . . . COOLER . . . DRYER



CHECK THIS NEW CONCEPT FIRST— DESIGNED AND BUILT BY VULCAN

A Vulcan kiln in your operation will simplify your foundation plans, lower your cost of erection and reduce your power load . . . all contributing toward substantial savings in your original investment. These advantages are made possible because of these exclusive patented features that are included in every new Vulcan Rotary kiln, cooler or dryer. New self-aligning trunnion rollers, New constant thrust load control, New pressure lubricating, New integrated girth gear and riding ring. Why not write today for Vulcan's new 10 page brochure, illustrating and describing the complete unit in detail.

SEVERAL TERRITORIES AVAILABLE FOR REPRESENTATION

"The Oldest Name in Rotary Kilns—Since 1849"

VULCAN IRON WORKS, INC.

MEMBER: National Limestone Institute, Inc.

WILKES-BARRE, PA. — CABLE ADDRESS: VULWORKS

ROTARY KILNS—COOLERS—DRYERS—SUGAR MILLS—SHEAVES
VERTICAL LIME KILNS—CALCINERS—ELECTRIC HOISTS—24' GEARS

Enter 195-B on card, page 217

Insurance Law

(*Concluded from page 170*)

be kept, so that in the event of a fire the insurance company will know the extent of the loss. In most jurisdictions these books and records are required to be kept in a fireproof safe.

The courts usually construe life insurance policies in a manner so as to avoid forfeiture of the rights of the insured; i.e., they are construed most strongly *against* the insurance company. Likewise, if there is an exempting clause in an insurance policy, such clause will most stronly against the carrier.

Agents Obviously, much could be written about the power and lack of power of insurance agents. The modern trend is that an agent has authority only to *sell* the insurance policy subject to *acceptance* by the home office. Insurance agents do *not* have authority to waive policy provisions. A general agent has more authority than a special agent, but his powers, too, are *limited*.

Riders Frequently an insurance company may extend the provisions of the policy by what is known as a *rider*. An example would be a case in which a property owner wishes to increase the face value of a fire insurance policy; and instead of writing up a new policy, the increased coverage is made by means of the rider.

If the insured engages in an occupation which is prohibited specifically in the policy, the insurance company will not be liable to the insured for injuries incurred in such occupation.

Terms The terms of the policy usually determine whether or not an accident is compensable. For instance, it would depend on the terms of the insurance policy whether or not an accident incurred in an elevator is compensable.

Most insurance companies include an *exclusion clause* so that they will be exempt from paying liability in the event that a motor vehicle is operated by a person under the statutory age limitation.

In the legal field of title insurance or real property, the subject (exclusions) may be important to you. Such insurance protects the buyer against encumbrances, liens, or title defects in existence at the time the title policy was issued. Usually, the title guarantee company lists the exceptions (that is, the defects in the title), and is not responsible for defects which are made exceptions in the title policy. The title guarantee policy covers everything regarding the title not specifically excepted in the title insurance policy.

Other Pointers Insurance is a personal and economic necessity for the successful operation of your company. In spite of utmost precautions, accidents causing loss or damage still may occur. Without adequate insurance protection your company may lose a part or all of its financial investment, and you may be liable for lawsuits against you and your business.

Finally, it is important to profitable management to carry adequate insurance. Handling and solving your insurance law problems requires frequent consultation with your own lawyer. His duty is to protect your interests.

NON-FLUID OIL PROTECTS PNEUMATIC POWER UNITS FROM RUST AND CORROSION

TRADE MARK REGISTERED

Ordinary lubricants cannot prevent air-borne moisture from attacking pneumatic power units and impairing their efficiency. However, the "NR" grades of NON-FLUID OIL were specifically designed to emulsify permanently with moisture and work to protect internal surfaces from rust and corrosion, sticking and gumming.

Pneumatic power unit manufacturers use and recommend "NR" grades of NON-FLUID OIL on their equipment to insure top power and operating efficiency. Hundreds of major pneumatic power unit users insist on "NR" grades as their lubricant.

You will understand why if you write today for a free testing sample of the "NR" grade of NON-FLUID OIL and Bulletin 550.

1896 65 YEARS 1961 SIXTY-FIVE YEARS OF LUBRICATION SERVICE TO INDUSTRY NON-FLUID OIL

NEW YORK & NEW JERSEY LUBRICANT CO.

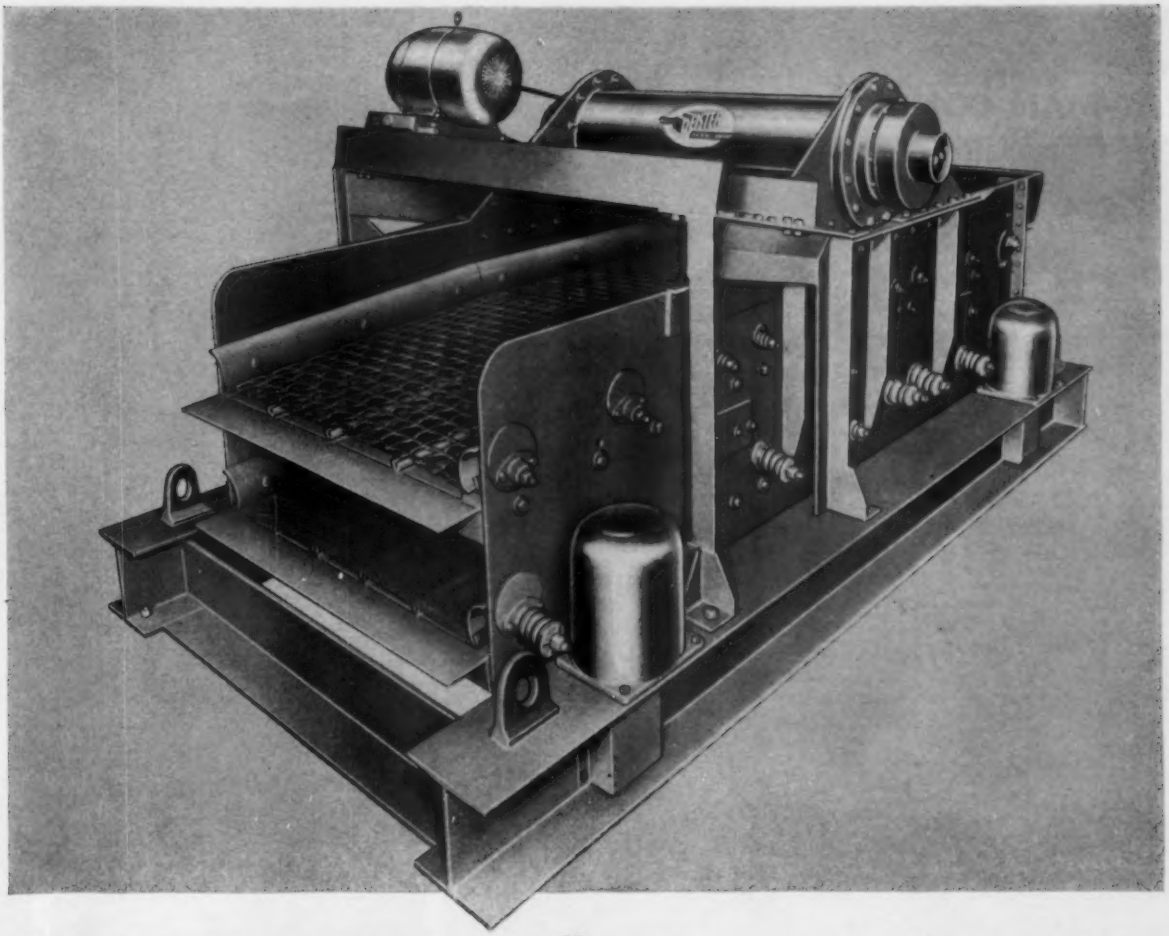
292 MADISON AVE., NEW YORK 17, N. Y.

WORKS: NEWARK, N. J.

WAREHOUSES • ATLANTA, GA. • BIRMINGHAM, ALA. • CHARLOTTE, N. C. • CHICAGO, ILL. • COLUMBUS, GA. • DETROIT, MICH. • GREENSBORO, N. C. • GREENVILLE, S. C. • PROVIDENCE, R. I. • ST. LOUIS, MO. • Also represented in principal industrial centers, in Pittsburgh, Pa., Cleveland and Cincinnati, Ohio.

NON-FLUID OIL is not the name of a general class of lubricants but is a specific product of our manufacture. So-called grease imitations of a NON-FLUID oil often prove dangerous and costly.

Enter 196 on card, page 217



Deister announces an all-new suspension system featuring ENCLOSED Spring & Rubber MOUNTS

"To provide the lowest cost per ton of material screened with the least amount of attention and downtime" —this has been the Deister objective throughout 35 years of vibrating screen manufacture.

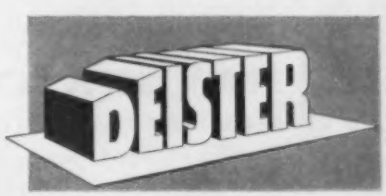
In line with this objective, Deister Machine Company has now developed an all-new suspension system for the "live" or vibrating frame of its line of vibrating screens. It consists of a heavy H-beam stationary base on which are mounted ENCLOSED Spring and Rubber MOUNTS to carry the "live" frame.

The new mounts are located *outside* the side plates at the four frame corners. Each mount consists of a heavy coil spring working in conjunction with a solid rubber isolator *to eliminate completely* the transmission of vibration to the supporting structure.

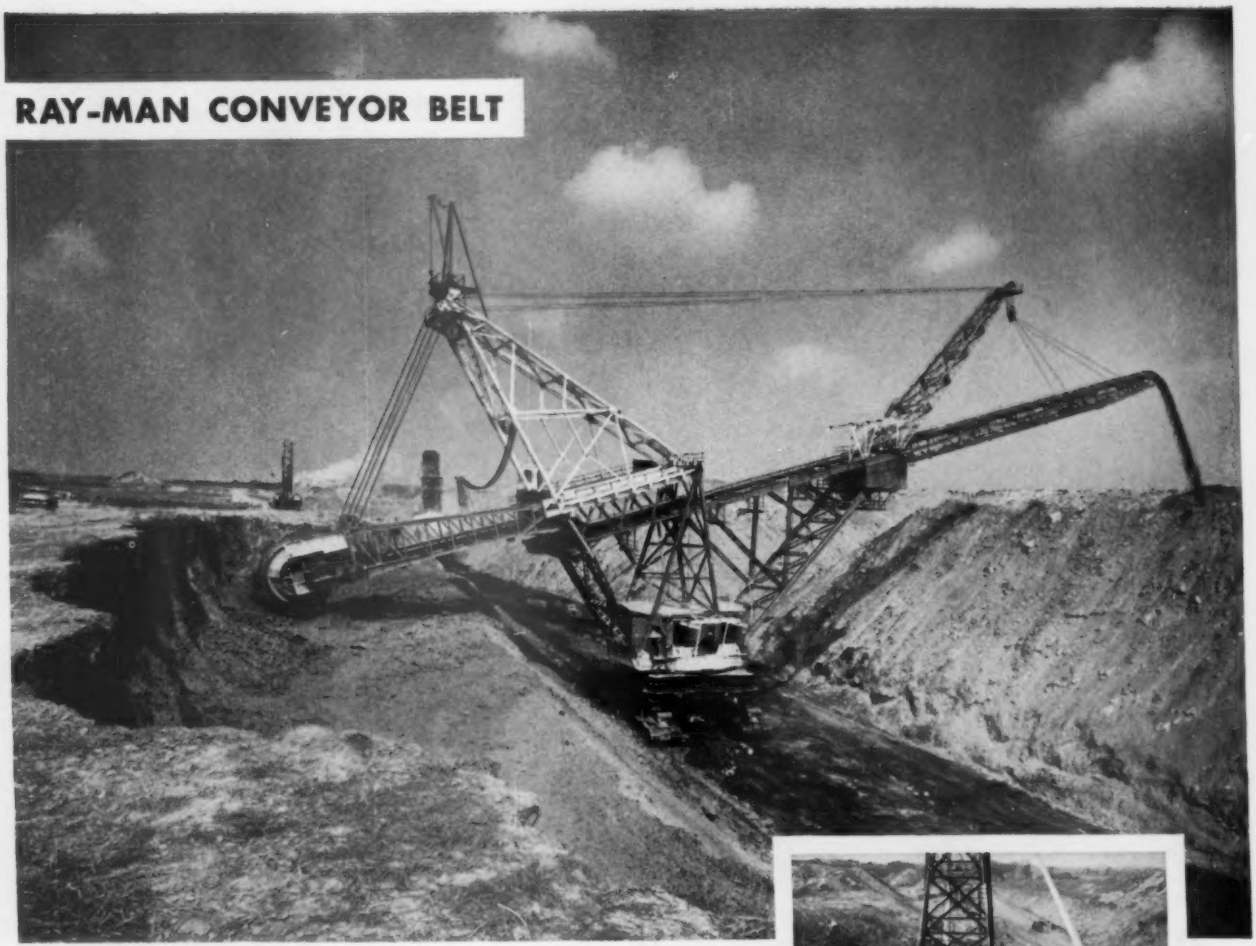
Each mount is protected by an easily removed cover. Spring adjustment or replacement, if ever necessary, becomes a simple "wrench" job that can be done in a matter of minutes.

No extra cost is involved if cable suspension is desired. Cables can be attached directly to the four lugs on the base. The effectiveness of the new mounts eliminates the need for cable suspension springs.

In order to simplify installation, Deister Vibrating Screens are supplied as a complete package instead of separate parts. The vibrating frame, stationary base, motor support and V-belt drive are assembled into a properly coordinated unit at the factory.



DEISTER MACHINE COMPANY
1933 East Wayne St., Fort Wayne, Indiana



RAY-MAN CONVEYOR BELTS On Giant Wheel Excavators

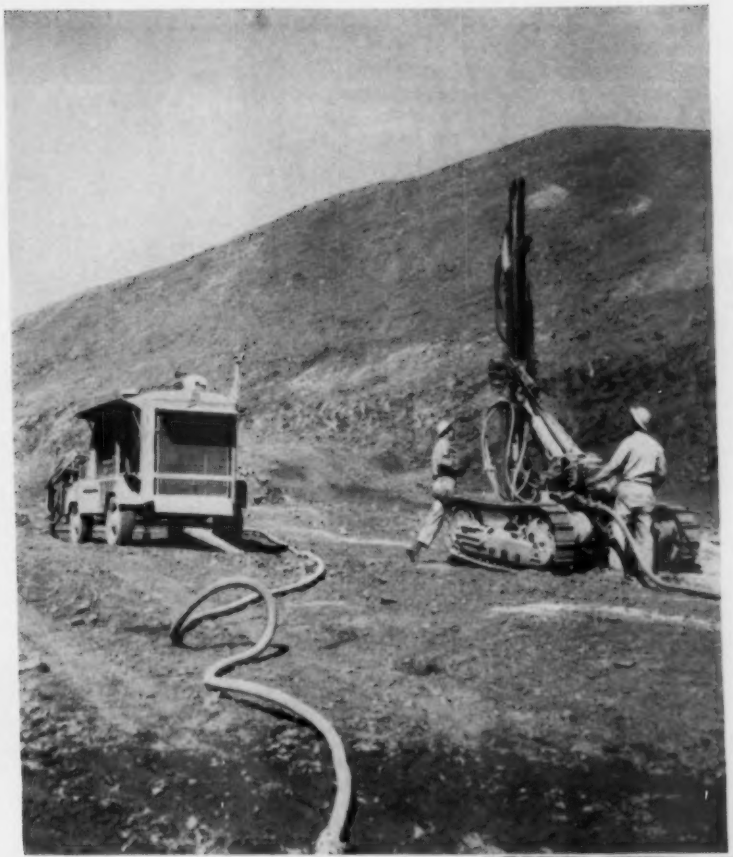
Move Overburden More Than 400 Feet ...At 5100 Tons Per Hour!

High-speed belt conveyors, with huge carrying capacities, are an integral part of this new 1,600 ton wheel excavator built for Peabody Coal Company at Bucyrus-Erie Company. High conveyor speeds—over 1,000 FPM—and high impact, put a tremendous strain on belt and belt splice. Ordinary belts can't take it. Ray-Man Conveyor Belting met the production standards of Peabody's giant earthmover—to handle *full* loads of overburden at *full* speeds *without* costly downtime for splice repairs!

Ray-Man belts on other machines of this type have hauled over 12,000,000 tons—outperforming all competitive belts. Splices last twice as long because double ply compensation relieves outer ply stress at bends. Ray-Man trains naturally, resists impact and ripping, requires no breaker ply. Exclusive XDC cover prolongs belt life. Let an R/M distributor show you how an R/M Conveyor Belt can outperform other belts on *your* conveyors. Write for Bulletin M302 and Catalog 25CB.

OVER 900 FT. OF 54" RAY-MAN CONVEYOR BELT are required for digging ladder and stacker conveyors on this huge Bucyrus-Erie Wheel Excavator. Machine will help increase output a million tons annually at Peabody Coal Company's River King Mine near Freeburg, Illinois.

RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION • PASSAIC, N. J.
ENGINEERED RUBBER PRODUCTS



HOMOFLEX HOSE Weighs Less Than Any Other Hose For Equal Pressure

It's flexible as a rope, too . . . the easiest handling air hose you can use. Homoflex has no pre-set twist . . . coils and uncoils in *any* direction *without* kinking. Strength member and tube are virtually inseparable. Uniform inside and outside diameters make it easier, *safer* to couple.

- **Super-Strong** — assures longer, trouble-free service life
- **Precision Built** — with super-strength, low-stretch cords
- **Mandrel-Made** — no pre-set twist
- **Kinkless** — coils and uncoils freely in any direction
- **Homogeneous Construction** — provides inseparable tube-to-cover bond
- **Safer, Easier To Couple** — inside and outside diameters are uniform

Ask about rugged Homoflex and other types of R/M hose for your applications. Write for Bulletins M620 and M694.

R/M POLY-V® DRIVE More Power in Less Space ...With More Reliability

A single, endless V-ribbed belt across full width of sheaves with mating grooves. Gives more power per inch of width and advantages never possible with conventional multiple belt drives.

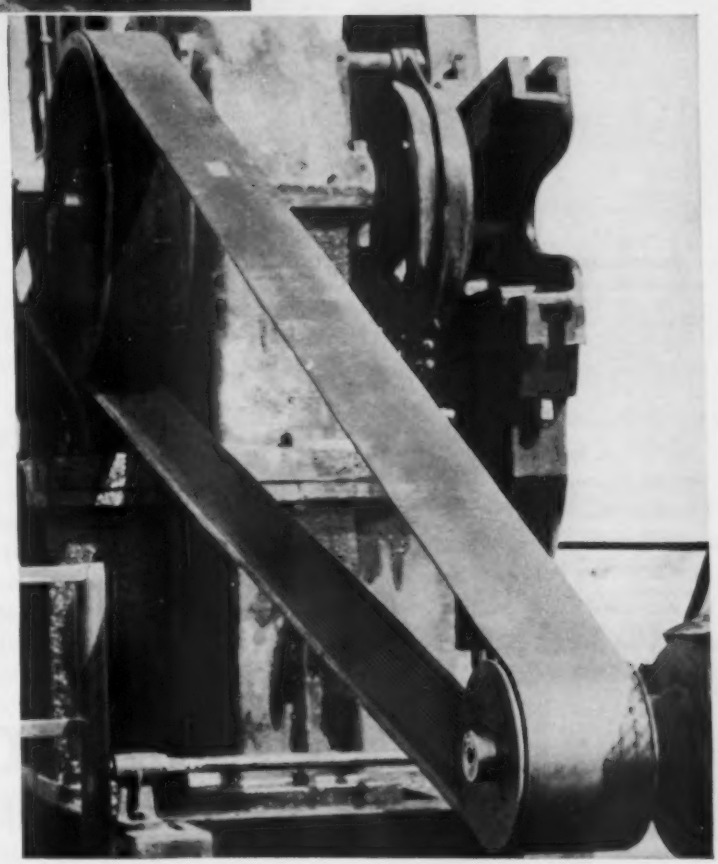
- **Simplicity** — *two* belt cross sections meet *every* heavy duty requirement
- **Reliability** — less maintenance, less take-ups . . . longer belt and sheave life
- **No Matching** — single unit belt eliminates "length matching"
- **Better Performance** — maintains groove shape, constant pitch and speed ratios . . . runs smoother, cooler

WHEN YOU CHANGE DRIVES CONVERT TO POLY-V*... AND BE SURE.

Write for Bulletin M141.

*patented

RM113R



HUGHES *ROTA-BLAST* Bits are engineered for mining

Type **HH**
ROTA-BLAST
Formerly type RG-2JS
for extremely hard
abrasive rock
(Taconite, quartzite)

Type **H**
ROTA-BLAST
Formerly type W7R
for hard rock
(Siliceous limestone,
dolomite, sandstone,
granite)

Type **M**
ROTA-BLAST
Formerly type OW
for medium rock
(Limestone, sandstone,
sandy shales)

Type **S**
ROTA-BLAST
Formerly type OSC-1G
for soft formations
(Calcite, shale, clay)

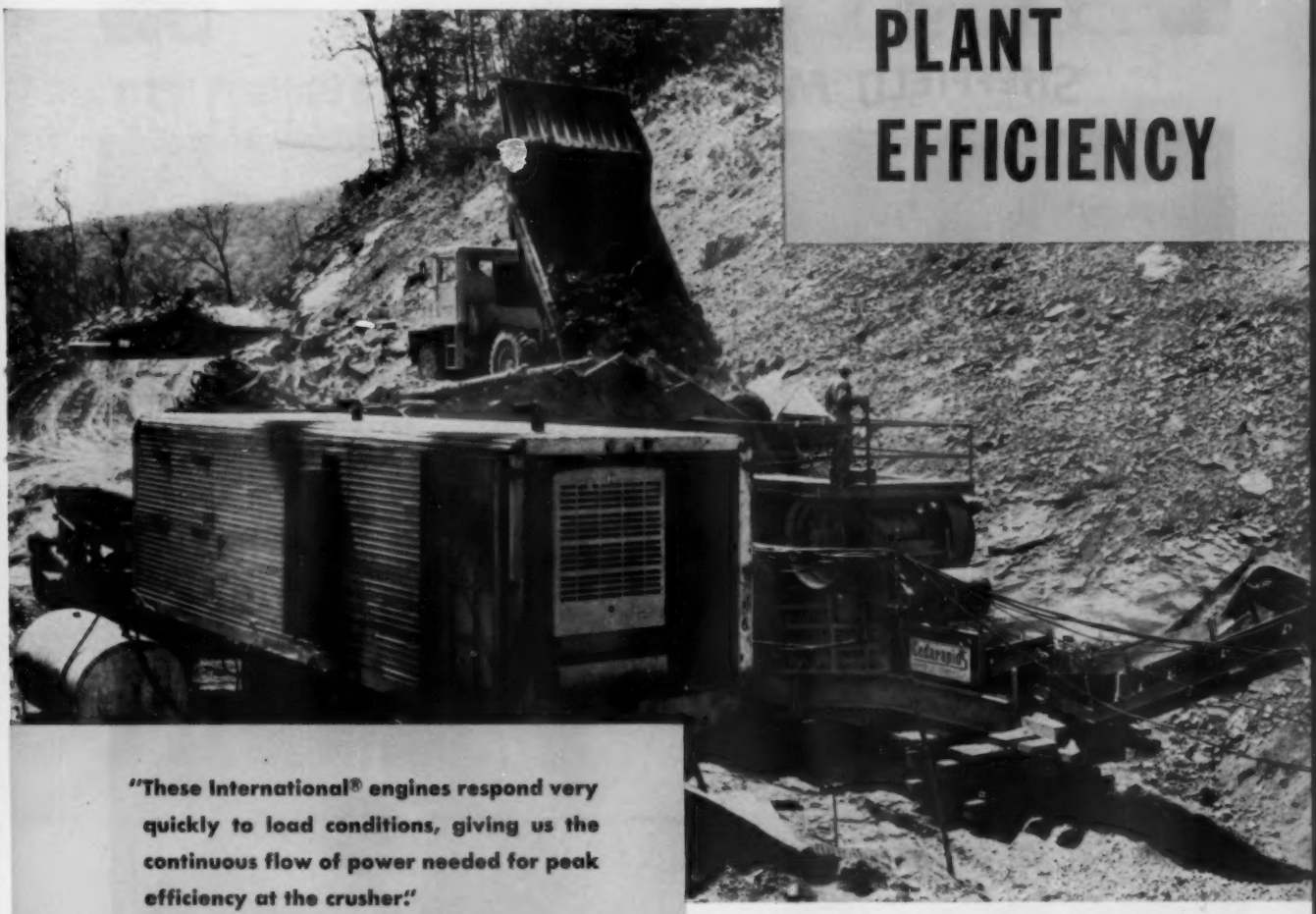
Hughes "Rota-Blast" rock bits and rotary drilling techniques, developed in close co-operation with operators and drill manufacturers, are increasing footage and penetration rate as much as 100% and more in areas where blast hole drilling is the toughest.

Hughes offers a complete line of "Rota-Blast" rock bits — each engineered for fast, economical blast-hole drilling in the specific range of formations for which it is designed.

Your Hughes representative can recommend the "Rota-Blast" bit best suited to your operation, and is also qualified to offer you assistance in your drilling program. Behind his recommendations are the world's largest rock bit manufacturing plant and more than a half-century of specialized rotary rock bit experience.

HUGHES
industrial products
HUGHES TOOL COMPANY • HOUSTON, TEXAS

Quick response to load.....BOOSTS PLANT EFFICIENCY



"These International® engines respond very quickly to load conditions, giving us the continuous flow of power needed for peak efficiency at the crusher."

—E. J. Nicholson, Treasurer, Rock Products, Inc.

Trailer-mounted power package drives Cedar Rapids 32 x 42 primary crusher and a 4¼ cone crusher, to produce 1½-inch minus material at a rate of 255 tph. The big turbocharged International engines supply enough power to handle newly installed equipment, with which the company expects to boost production 1,000 tons per day. Payhauler trucks are also powered by the "817" giving this operation the further advantages of standardized power.

Here's an example of the "extra efficiency edge" that helps aggregate producers bid competitively and still make a decent profit. The Sylva, N. C. crushing plant of Rock Products, Inc. gets this boost from International power. Two 375-hp UDT-817 Diesel engines drive Ready-Power generators in this all-electric plant. When a big International Payhauler® dumps a load of blue granite into the primary, the engines' governors react instantly, equalizing power to match the load, and keep the plant operating at peak efficiency. This fixes output at maximum capacity and increases production by three or four tons per hour. **Figure out what it means** to add a few tph to your normal production rate. Translated into dollars-and-cents-per-year, this increase puts a tidy sum in the profit column, and considerably reduces write-off schedules for your equipment. You can move closer to the "extra efficiency edge" with a call to your nearby International Engine Distributor or Dealer. Ask him for complete information on the IH line—35 engines from 16.8 to 385 max. hp. Call him soon!

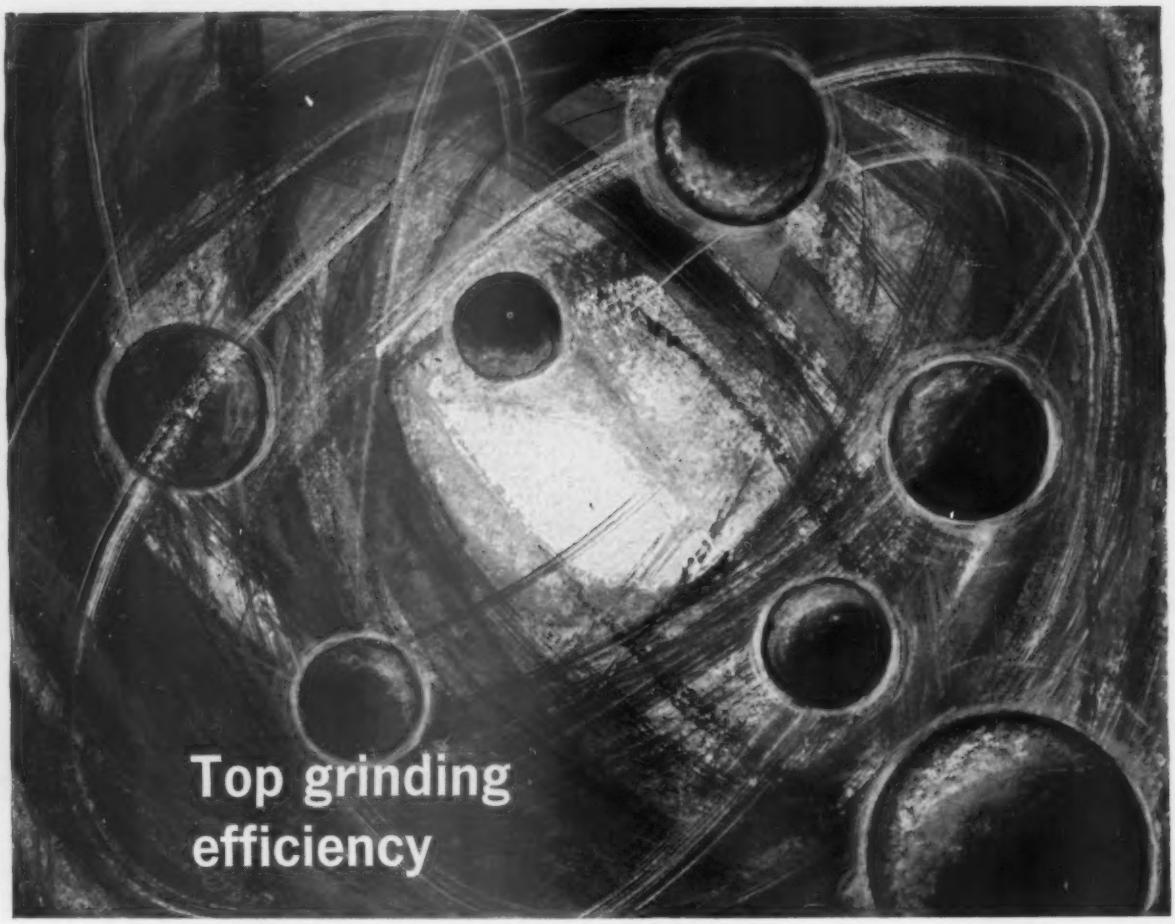
INTERNATIONAL®
IH ENGINES

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

Strong
Tough
Economical
Efficient
Lasting

Steel

SHEFFIELD MOLY-COP Grinding Balls



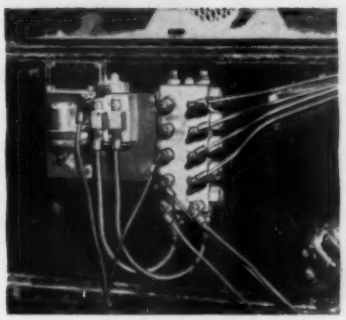
has earned customer acceptance

Around the world, over a million tons of Sheffield Grinding Balls have given customers the top efficiency that comes from consistently uniform hardness, toughness and fine, dense grain structure right to the core. This uniform grinding efficiency (which also means uniform economy) is the result of Sheffield's constant quality control in alloying, forging and heat-treating — from furnace to finished ball. **Sheffield Plants: Houston, Kansas City, Tulsa.**

ARMCO Sheffield Division

This "big baby" bites deep and hard

...AND ALEMITE CENTRALIZED LUBRICATION KEEPS IT WORKING SMOOTH AND SURE!



This centralized system is located on the crawler assembly of a giant quarry shovel. Other systems lubricate boom sheaves, house bearings, automatically.

For quarry shovels that operate 24 hours a day, protection against dust, dirt, and other elements is a must. With an Alemite Accumatic Centralized Lubrication system, around-the-clock production is insured.

Whether it's power shovels, crushers, dust collectors, conveyors, coolers or any piece of equipment needing lubrication, Alemite can "Tailor Make" a centralized system to eliminate lubrication problems.

Alemite Centralized Lubrication Systems protect equipment with pre-determined amounts of lubricants from one central point to every point where it's needed. Lubrication is quick, safe and positive. And there's no waste. Equipment life is extended, downtime sharply reduced. End result: more production . . . and increased profits.

See "The Better Way"—a new, factual color film produced by Alemite to show how one mill has increased production and profits through modern lubrication practices. Write today!

Symbol of SW Excellence

ALEMITE DIVISION
STEWART-WARNER CORPORATION

In Canada: Stewart-Warner Corporation of Canada, Ltd., Belleville, Ontario

Dept. S-51, 1850 Diversey Pkwy., Chicago 14, Ill.

How the clam-action

4-in-1 gives you

'equipment spread' utility...

with a one-man "crew"!

Move the "machine action" selector lever—see for yourself how the International Drott 4-in-1 gives you equipment spread utility with a one-man "crew"—does dozens of jobs, other excavator-loaders can't touch! Prove that the 4-in-1 saves you the expense of buying or renting additional machines, and of hiring extra operators. Let your International Drott Distributor demonstrate!

International Harvester Co., Chicago 1, Illinois

Drott Manufacturing Corp. Milwaukee 15, Wisconsin

INTERNATIONAL DROTT

You get a full-capacity, earth rolling bulldozer simply by opening the 4-in-1's clam—with 2-finger hydraulic lever ease. This TD-15 Four-in-One is clearing off brush and removing overburden from a deposit of sub-base materials.

Let the 4-in-1 double for a boom-type shovel in many conditions—as this operator does. Here, his 1⅛ cy. yd. TD-6 Four-in-One applies famous pry-over-shoe break-out action and "doubles for dynamite" to dig hard materials without shooting.

End sticky materials problems for good, the way dredging contractors do: with positive clam-action bottom-dumping. Note how opening the 4-in-1's clam pulls materials from bucket surfaces—and gravity down-pull does the rest—to enforce positive, self-cleanout dumping.

You can back-drag materials wholesale (and safely) from the sand, clay, or gravel bank. And use this same action to grab, carry, and load heavy, unwieldy "impossibles" including stumps, boulders, and slabs of rock—without delay or extra help!

Du Pont reports on

a new type of conveyor belt carcass

that sets new standards of performance

Made with load-bearing components of DACRON® fiber, it resists deterioration better, carries more, cuts handling costs

Today, a new type of conveyor belting offers you cost-saving performance on the toughest jobs in industry. The reason is a fabric carcass made with strong reinforcements of "Dacron"* polyester fiber running the length of the belt.

Superior resistance to deterioration—"Dacron" is not affected by rot and mildew, so these belts do not have problems with moisture in cover cuts, or when fabric is exposed in the splice area. "Dacron" also withstands belt-fastener rust and most chemicals to assure long service under tough, wet or dry operating conditions.

Improved durability—Impact resistance is excellent. The high strength of "Dacron" teams up with the strength and elasticity of nylon, the cross fiber, to sustain shock loads. "Dacron" resists stretch. This means lower growth of the belt in service—fewer take-ups.

Better flexing and troughing—Because of this high-strength carcass made with "Dacron", these belts can be thinner, permitting the use of smaller-diameter pulleys. They are more flexible, train better on idler rolls—resulting in less belt wander and edge wear. These belts have a better resistance to flex failure—an important long-life feature.

Troughing up to 45° is possible, compared to the usual 20°. This means belts can be narrower and lighter—and still carry larger loads. The result is reduced handling costs right down the line!

More for your belt dollar—It all adds up to superior performance and the economy of long service with fewer belt replacements, less down-time, lower maintenance costs. Make sure you ask about conveyor belts made with "Dacron" polyester fiber next time you order—get the most for your belt dollar!

E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Dept., 191 South Main St., Akron 8, Ohio.

*Du Pont's registered trademark for its polyester fiber.

DU PONT
REG. U.S. PAT. OFF.
Better Things for Better Living
. . . through Chemistry

DACRON® *polyester*
the conveyor belt fiber

CHEVROLET

SEEN IN ALL THE WORST PLACES

They keep showing up in places most trucks can't get to because it takes an awful lot to stop these sure-footed Chevy four-wheel-drive models! Where the job calls for the mobility of a mountain goat teamed with the stamina of a mule, you'll find no finer way to get your work done. And for 1961 the Chevrolet 4-wheel drive lineup is a full dozen models long. You can pick from a *wide* selection — one that's sure to include the best answer to your toughest traction-plus requirement!

■ Put any one of these 4-wheel drive Chevies on any job—then watch it dig in and *go!* Come what may in the way of mud, snow, sand, loose gravel, creek bottoms, swampland or freshly plowed ground, you can rest assured that the extra bite of up to double traction — plus stump-jumping road clearance—will get you through every time.

And you'll like the way a Chevy 4x4 rolls down the highway in smooth 2-wheel drive, ready to give you 4-wheel traction at the flick of a lever, the moment you need it. You'll appreciate the no-clutch shifting ease of the transfer case (whether moving or standing still) and the extra versatility that's yours with a choice of 4-wheel direct or underdrive.

If you prefer the extra snap of spirited V8 power, it's yours at nominal extra cost in any model. Also available at extra cost are heavy-duty 3-speed and 4-speed transmissions and a wide choice of traction tires. You can tailor your Chevy 4 x 4 to fit your needs exactly. Get the full details and turn your traction problems over to Chevy—the traction champ of them all!... Chevrolet Division of General Motors, Detroit 2, Michigan.

FLEETSIDE

Model	Max. Load	Body Length
K1434	1400 lb.	6½′
K1534	1300 lb.	8′
K2534	2950 lb.	8′

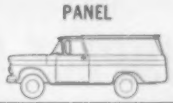
STEPSIDE

Model	Max. Load	Body Length
K1404	1450 lb.	6½′
K1504	1350 lb.	8′
K2504	3050 lb.	8′

CHASSIS-CAB

Model	Max. Load	Wheel-base
K1403	1900 lb.	115″
K1503	1850 lb.	127″
K2503	3500 lb.	127″

PANEL



CARRYALL

Model	Max. Load	Body Type
K1405	1300 lb.	7½′ Panel
K1406	1000 lb.	Carryall (panel type rear doors)
K1416	1000 lb.	Carryall (tailgate and liftgate)

SEND COUPON TODAY

PLEASE SEND COMPLETE INFORMATION ON THE CHEVROLET 4-WHEEL DRIVE LINEUP TO:

Name_____

Company_____ No. of trucks owned_____

Address_____

City_____ Zone_____ State_____

Fill out and mail coupon to:
Commercial and Truck Dept.
Chevrolet Motor Division
General Motors Corporation
Detroit 2, Michigan

38

1961 CHEVROLET STURDI-BILT TRUCKS

CHEVROLET

UNIVERSAL IMPACT MASTER'S EXTRA PRODUCTION CAPACITY KEEPS TWO SECONDARY CRUSHERS WORKING HARD

Why Extra Production Capacity? Because Universal Impact Master's *straight-line flow* eliminates bottle necks, rebounding and congestion.

Rock, falling into the breaking chamber is shattered by the hammers and hurled forward through the upper screen grate. Oversize, falling into the second rotor hammers, is reduced to size and discharged. The rock always moves in a straight-line flow because the hammers turn in the same direction. All finished material is immediately removed from the breaking chamber.

Less power is required to get this high production. You get more tons per hour at a lower cost. And the highly cubicle finished product meets today's rigid specs. Gradation is controlled by simple adjustments.

Enjoy the *extra* dollar and cents benefits of Impact Master's Straight-line Flow. Just contact your Universal distributor for complete information.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

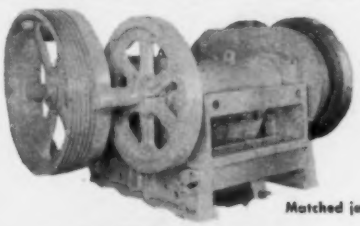
UNIVERSAL ENGINEERING CORPORATION

619 C Avenue N.W., Cedar Rapids, Iowa

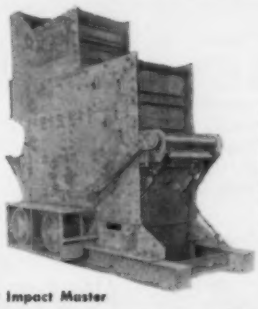
A subsidiary of Pettibone-Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

Systemized engineering means much more than just engineering . . . it means a systematically planned plant to produce more . . . at greater profit. □ Universal *systemized* engineering begins with analysis of your job . . . your specs . . . your market. It means planning for profit with the most complete line of equipment available . . . fitted to your needs! Modern specifications demand the latest methods. Universal *systemized* production brings you the most progressive concept in aggregates production available today. Call in your Universal engineer to develop modern planning for your EXTRA production . . . EXTRA profit.

UNIVERSAL *Systemized* ENGINEERING means EXTRA production . . . EXTRA profit!



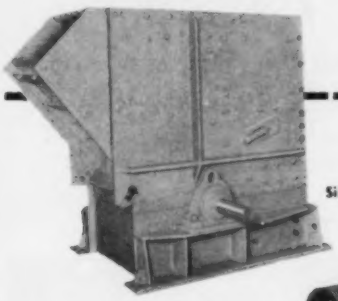
Matched jaw crusher



Double rotor Impact Master

PRIMARY CRUSHING

No guesswork about primary crushing with *systemized* planning . . . careful analysis of your pit or quarry tells you which type of primary crusher you need to get those extras. **Single jaw crushers, matched jaw crushers and Impact Masters** are available. Universal *systemized* engineering will tell you which will be best for your needs. Full line of feeders, to fit the crusher, available too!

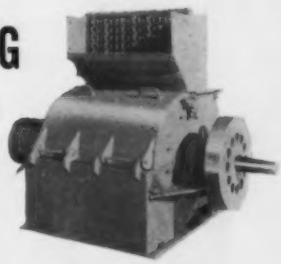


Single rotor Impact Master

Roll crusher

SECONDARY CRUSHING

Perfectly balanced production of secondary crushing with your primary is possible only through *systemized* planning. Your specs and market tell you which machine is best suited for your plant. Universal's wide range of sizes in **roll crushers, Impact Masters, hammermills and cone crushers** puts the right machine in your production and profit team.



Hammermaster Hammermill

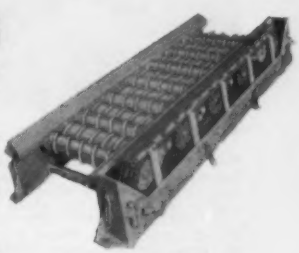
Screenmaster Horizontal Screen

FEEDING . . . SCREENING . . . CONVEYING

Universal's Wobbler Feeder "walks" material to the crusher and separates the fines at the same time. Scalping and feeding is in a class by itself.

Positive, snappy screening with **Universal's Screenmaster horizontal screen** assures high volume separation without blanketing or blinding. Exclusive rubber bushed phasing bars and air springs eliminate production robbing "cornering".

To handle large volumes of material, **Universal conveyors** provide a size, length and type for every service.



Wobbler Feeder

NEW FREE CATALOG...

Learn how you can get EXTRA production . . . EXTRA profits with Universal *systemized* Engineering. New catalog tells the complete Universal *systemized* equipment story. Send coupon at right! →

UNIVERSAL ENGINEERING CORPORATION
625 C Avenue N.W., Cedar Rapids, Iowa

Please send my copy of the New Universal Brochure.

NAME _____

COMPANY NAME _____

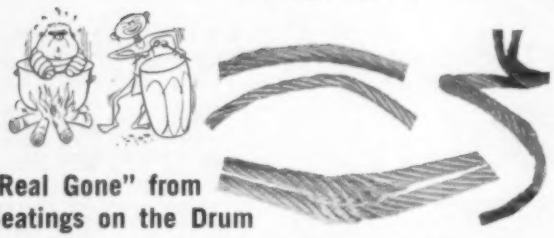
ADDRESS _____

CITY _____

STATE _____

Union Wire Rope

Tough-job "champs"--Union Wire Ropes and Slings



"Real Gone" from Beatings on the Drum

Even under normal operating conditions, drum wear gives wire rope severe punishment. This wear concentrates at the cross-over points and at the flange. Excessive drum crushing results from operating on small drums, excessive loading and poor winding. Smooth drums are not recommended. Here are typical "drum beatings"; cross-over wear; cross-over crushing on drum; drum crushing from poor winding; drum-crushing from small drum.

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line by improving drum conditions. Union Wire Rope Engineers will help you with this problem.

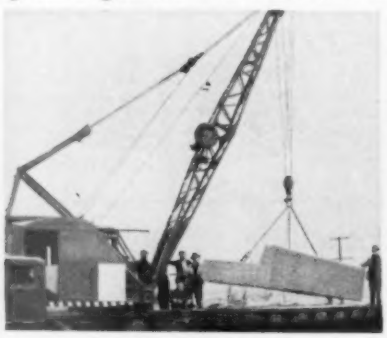
On the "Blink" from a Kink

This open kink resulted from mishandling of rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller. Always enlarge it, then straighten out the rope.

Each Union Tuffy is Engineered to Meet a Different Tough Job

Tuffy Scraper Rope

Flexible enough to take sharp bends; stiff enough to resist looping and kinking when slack; highly resistant to the shock of load impact—that's Tuffy balanced construction. Mount a reel on your scraper—save wasting sound rope.



Tuffy Slings and Hoist Lines

Slings are a patented, 9-part machine-braided wire fabric that is next to impossible to knot or kink. Hoist lines have built-in strength, toughness, flexibility. Balanced—a top-performing team for handling every type of material. In addition to Tuffy, Union Wire Rope furnishes a complete line of slings.

Tuffy Dozer Rope

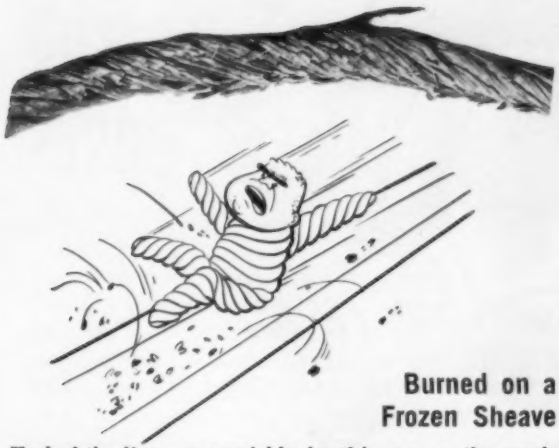
Mounts right on your dozer in a 150′ reel. When rope shows wear, just feed through enough to replace the damaged part. Saves rope, gives you a bonus of extra service. Also available in 300′ and 500′ reels.

Look to the Union Wire Rope Organization for "Right Rope" Service. Union has more than 1600 standard constructions, *plus* the special Tuffy family of wire ropes and slings tailored to exacting special needs. For many years people with special wire rope needs have been coming to Union for help. That's the way the Tuffy family grows. Our research laboratory is at your service. If we don't already have it, we'll design and fabricate just the rope or sling you need. And you'll be sure of Union strength, Union flexibility, Union job-tested quality. Call your Union distributor—see the phone book Yellow Pages.

Tuffy Tips

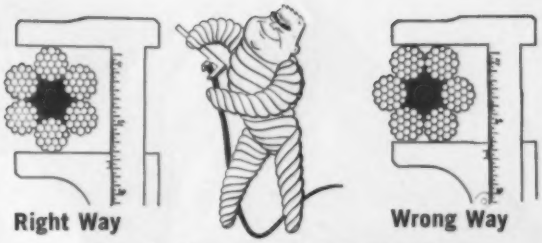
New steels are born at Armco

keep the title longer with proper handling.



Burned on a Frozen Sheave

End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.



How to Measure Rope Diameter

To get the most service, efficiency and safety out of wire rope operation, rope and sheaves must be precisely fitted to each other. There's only one right way to measure rope diameter: use machinist's calipers and be sure to measure the *widest diameter.*

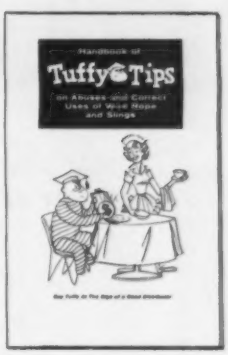
A slight shift of the rope in the calipers, as shown above, will give you a misreading which would result in ordering an undersize rope. Note that the measurement at right shows 1/8" under correct diameter. Be sure to double-check every time!

Tuffy Dragline Rope

High abrasive resistance and super flexibility. Gives long service, dependable action in handling any material—wet or dry dirt, sand, gravel, rock, minerals. Rides smoothly on grooves—hugs the drum when casting for full load.

Union Wire Rope Handbook of TUFFY TIPS... Free!

The "Tuffy Tips" shown here are quoted right out of Union's handbook. In it there are dozens of other priceless hints on the correct use of wire rope. The common abuses and how to avoid them. How to save costly injuries. Maintenance tips. The proper fittings and how to apply them. Recommended sizes. Many other facts and suggestions that will cut down your rope costs and help you get out of wire rope the full service we build into it. No charge. Write Union Wire Rope, Armco Steel Corporation, 2132 Manchester Ave., Kansas City 26, Missouri.



2-61

ARMCO Union Wire Rope

A SPARK CAN BE A DEADLY MISSILE

Such a little bit of carelessness can cause such a great amount of damage.

Loss of life, loss of vacation lands, loss of timber and watersheds can result from one cigarette thoughtlessly flipped from a car window, or one burning match dropped beside the road.

During these fire hazard months, a spark of any kind can be a deadly missile. And every year, our forest areas become more and more vital to the nation's welfare.

So be extra careful this year. Use your car ash tray. Douse your campfires. Be sure all fires are out, dead out. Be sure *you* don't cause a shameful forest fire. (Every year, some people do. 9 out of 10 forest fires are still man-caused.)

Remember Only You Can... PREVENT FOREST FIRES!

Like other American business firms, we believe that business has a responsibility to contribute to the public welfare. This advertisement is therefore sponsored in cooperation with The Advertising Council and U. S. and State Forest Service

ADVERTISING COUNCIL · PUBLIC SERVICE ·

Special Report to Users of Caterpillar Equipment: Custom TRACK SERVICE

Custom Track Service saves coal stripper $3298 by adding 3800 hours to track life

A coal stripper, ripping and 'dozing rocky overburden 7 days a week around the clock, was averaging 2300 hours of life before he *replaced* most of his totally destroyed track group parts. At the suggestion of his Cat Dealer, the stripper tried new, larger-size undercarriage parts. By following recommendations of the dealer's undercarriage specialist at 2440 and 4030 hours, the undercarriage went a total of 6100 hours with only pin and bushing replacements . . . and all but the shoes were rebuildable instead of scrap! Up to this point, Custom Track Service saved the stripper a $3298 cash outlay; and since he was able to rebuild the links and reuse the pins and bushings instead of replacing with new assemblies, he realized additional savings.

PAST EXPERIENCE

ALL BUT SHOES READY FOR SCRAP PILE AFTER 2300 HOURS

PRESENT EXPERIENCE

COMPLETELY REBUILDABLE EXCEPT SHOES AFTER 6100 HOURS

HOW CUSTOM TRACK SERVICE HELPS LOWER COSTS

Custom Track Service, available only from your Caterpillar Dealer, is designed to help you get the most possible service from undercarriage parts and thus cut costs. Factory-trained specialists are ready to help solve your particular track problems. They can give sound recommendations to help you get the most from your undercarriage.

They can advise you on maintenance . . . help you tailor the many special undercarriage parts and track options available to meet various job conditions. As a result, costs per hour go down and profit and machine availability go up.

These undercarriage specialists are backed by modern track undercarriage rebuilding facilities manned by experienced personnel . . . by the largest and most complete stock of standard and special application parts available . . . by Parts Exchange Assemblies that keep tractors working and earning.

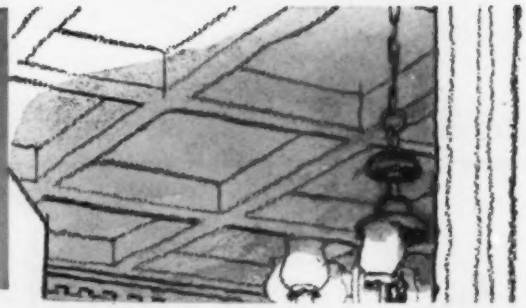
Check with your Cat Dealer and learn how Custom Track Service can help you to reduce costs.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

"We were taking the plan for granted"



"You know, Ed, it's so easy to take these things for granted. I knew we'd put in the Payroll Savings Plan a long time ago. So I just assumed we had a good, sizable number of our employees who were buying U.S. Savings Bonds regularly.

"Well, last week our chairman asked me for the exact figures. When I checked up I found we had less than a third of our people making regular use of the Plan. We needed to have someone explain—in person—the convenience and soundness of this fine thrift program.

"I contacted our State Savings Bonds Director right away. With his quick, friendly help we set up a thorough canvass of everybody on the staff. We found that many of our company family were just waiting to have someone tell them how simple it is to share in this sound, systematic thrift plan. Then the polite suggestion, 'And why not start now?' really did the work. Today we have a participation we're proud of, and we're taking steps to increase it still more, every payday."

Experience of leading companies shows that spreading Payroll Savings information through the organization, person-to-person, results in quick increases in participation. And that brings such welcome benefits as lower employee turnover, better safety records and the keen satisfaction of helping your people to contribute to our Nations Peace Power.

ALL U.S. SAVINGS BONDS—OLD OR NEW—EARN ½% MORE THAN BEFORE

PIT AND QUARRY PUBLICATIONS, INC.

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

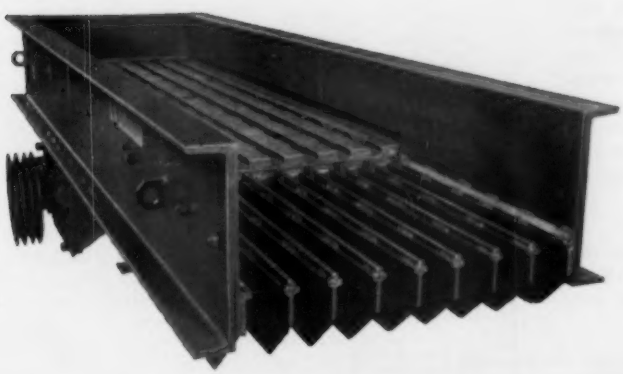
PROFIT 7 WAYS WITH

SIMPLICITY

GRIZZLY TYPE FEEDERS

1. FEED AND SCALP WITH ONE UNIT
2. ELIMINATE PLUGGING OF CRUSHER
3. REDUCE LOADING HEIGHT
4. PROLONG BELT CONVEYOR LIFE
5. LOWER MAINTENANCE COST
6. LOWER INSTALLATION COST
7. SAVE SPACE—COMPACT

Simplicity Grizzly Feeders are designed to convey and scalp in one operation, thus eliminating the costly apron feeder and separate stationary grizzly. Fines are scalped off and pass through the grizzly section, allowing only the oversize material to reach the crusher. Fines are deposited on the conveyor belt first, making a bed for the larger rock, thus contributing to longer belt life.



Simplicity Grizzly Feeders are spring mounted, which allows for heavy impact without damage to the machine. Impact bars will be added to the pan section at customer request. Side liners are standard at no additional cost.

Simplicity Grizzly Feeders are equipped with replaceable grizzly sections, which allows for various openings by simply changing deck sections, or the ALL NEW ADJUSTABLE Grizzly section which is so designed that one or more of the grizzly bars can be taken out, or added, to arrive at the opening desired.

Simplicity Grizzly Feeders are available in four separate models and in sizes for most operations.

Simplicity TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 12, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario.
FOR EXPORT: Brown & Sites, 50 Church Street, New York 7, N. Y.

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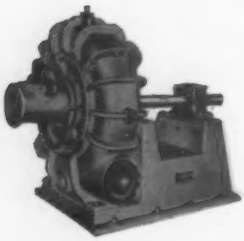
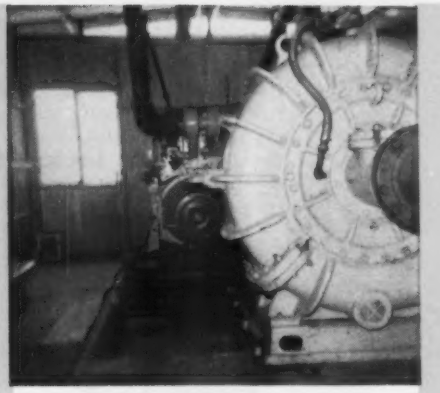
Enter 215 on card, page 217

← Enter 214 on card, page 217



HOW TO MAKE MONEY

in the sand and gravel business



Thomas pump installation at Allendale Gravel Company and James Litherland, Jr., whose letter appears below.

If you could increase your sand and gravel production 3½ times before you need any pump repairs, what would you do?

That is the performance record of Thomas DURABLE Dredge Pumps for Allendale Gravel Company, Allendale, Illinois. Read Mr. Litherland's letter at the right. His experience of over 7 years of low cost service of his first THOMAS pump was so satisfactory that he now has installed a second THOMAS pump. It is a matter of record that THOMAS pump users always choose another THOMAS when they need a second pump. They have learned that the wearing parts of Thomas pumps outlast the working parts of other pumps by a tremendously wide margin.

If you need a pump, investigate the facts and you'll find you have been missing a good thing. You'll install a THOMAS pump because "you can not buy any other pump that will make you as much money."

Thomas DURABLE Dredge Pumps are manufactured in range of sizes from 6" to 16" discharge. Write or phone for additional information.

Allendale Gravel Company

Screened and Washed Sand and Gravel for Road and Concrete Work

J. E. LITHERLAND — Allendale, Illinois

February 7, 1961

Thomas Foundries
P. O. Box 1111
Birmingham 1, Alabama

Attention: Mr. Joe Keeton

Dear Sir:

In May 1953, we replaced our manganese pump with a 6" Thomas durable dredge pump. Our old pump would need replacement parts about every 3 months or 30,000 tons total production. Our Thomas has produced as much as 100,000 tons total production without repairs.

In January 1960 we decided to increase our capacity by adding another pump. After 7 years of low cost service with our 6" Thomas pump we readily decided to use Thomas for our addition. Our new pump is a 10" suction 8" discharge and is producing sand and gravel from the Wabash river adjacent to our six inch pump located in a pit. We now feel our production has more than tripled since the installation of our first Thomas pump in 1953.

We want to take this opportunity to thank you for your cooperation and service without which this feat could not have been accomplished.

Yours very truly,

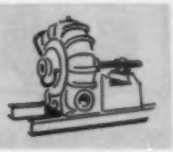
ALLENDALE GRAVEL CO.

James E. Litherland, Jr.

JELikr

THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA



more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

ALLOY GRINDING BALLS manufactured by *The Colorado Fuel and Iron Corporation* are listed in a folder by diameter and hardness for carbon steel and alloy steel balls. The chemical range and the cumulative average hardness for each size is shown. **(301)**

DRAG CHAIN, SCREW CONVEYOR, GRINDING crusher, mill, kiln, and dryer replacement parts and service are offered in a folder released by the *Bethlehem Foundry and Machine Company*, Cement Mill Machinery Division. Castings are fabricated from gray iron, steel, and ductile iron, as required. **(302)**

X-RAY ANALYSIS FOR INDUSTRY is explained in an illustrated booklet available from *Applied Research Laboratories, Inc.*, subsidiary of Bausch & Lomb Incorporated. Quantometers, recording consoles, and accessories for controlled production are included. **(303)**

PROCESSING GRANULAR SOLIDS with the minimum of product loss or degradation by using the Fluid-Flo dryer is described in an illustrated folder released by *Link-Belt Company*. **(304)**

A NEW HEAVY-DUTY ROTARY COMPRESSOR for general purpose services, including delivery of oil-free air, gas or vapor, is described in an illustrated brochure published by *Fairbanks, Morse & Co.* Performance coverage—capacity to 21,000 c.f.m. and pressure to 250 p.s.i.g.—is given. **(305)**

VIBRATORS FOR USE ON HOPPER CARS, BUNKERS, and chutes are described in a folder from *Martin Engineering Company*. The "Vibrolator" line of vibration inducers include air-, electric-, gasoline-, and hydraulic-powered vibrators for use on railroad hopper cars, bunkers, chutes, etc. **(306)**

THE JOY FLEXITITE ALL-RUBBER PUSH BUTTON station for oil-tight and duty service is described in a folder released by *Joy Manufacturing Company*. The unit is recommended for all 2-button applications and meets N.E.M.A. type 1, 3, 4, 5, and 12 enclosure requirements. It is said to be corrosion proof, dust and moisture proof, and electrically safe. **(307)**

MULTISPEED MOTORS—variable-torque, constant-torque, and constant-horsepower—both polyphase and single phase—are discussed in a folder from *Century Electric Company*. **(308)**

BONNETLESS KNIFE GATE VALVES for use on fibrous, viscous, and slurry lines handling corrosive and abrasive materials are described in an illustrated folder released by *Dezurik Corporation*. **(309)**

"THE HARDER IT PUMPS THE BETTER IT SEALS," is the claim made for the Vacseal pump in a brochure published by *The Galigher Company*. Performance curves give capacities of the various models in relation to the specific gravity of the pulp handled. The pumps are designed so that the material pumped does not come in contact with the packing or the shaft sleeve. When the pump is operating the pressure on the gland is less than atmospheric pressure. Sealing water is not required. **(310)**

DEEP-DIGGING SLACKLINE CABLEWAYS used to recover sand and gravel deposits and excavate and haul bulk materials are described and illustrated in a pamphlet available from *Sauerman Bros., Inc.* Haul distances and capacities are tabulated. **(311)**

MAY **PIT AND QUARRY** **1961**

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

Void after 60 days.

_____ _____ _____ _____ _____ _____

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more information, please

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SERIES 88 ROTARY POSITIVE BLOWERS for pneumatic conveying, sludge and mud pumping, and related uses are set forth in a brochure published by *Sutorbilt Corporation*, subsidiary of Fuller Company. Charts explain operations, and tables list horsepower ratings and capacities. (312)

ROTARY AND PERCUSSION AIR drilling are demonstrated in a 20-minute sound movie available on a free loan from *Gardner-Denver Company* for groups and companies interested in the solution of rock drilling problems. Zephyr, Hurricane, and Tornado rigs are shown on location. The movie explains the differences between percussion and rotary air drilling and shows which of the two methods is faster and cheaper in a given situation. The movie won a top award in the annual industrial films competition of *Industrial Photography* magazine. (313)

ALLIGATOR V-BELT FASTENERS are listed in a specifications folder published by *Flexible Steel Lacing Company*. Tables covering the various factors involved in selection of belting are included. (314)

LUBRICATION is thoroughly covered in a series of brochures released by *Cities Service Oil Company*. Photographs, cutaway diagrams, and line drawings illustrate the booklets. Procedures and recommendations are covered in considerable detail. Three of the titles are: "Earthmoving and Construction Machinery Lubrication;" Air Compressor Lubrication," and "Diesel Engine Lubrication." Indicate in your request which of these you wish. (315)

THE SOLUTIONS OF SCREENING PROBLEMS in the nonmetallic minerals and other process industries are given in a series of case histories in a publication from the *Southwestern Engineering Company*. The booklet tells how the Vibro-Energy separator has reduced costs, increased efficiency, and upgraded products. (316)

THE 922 SERIES A TRAXCAVATOR design features are given in a pamphlet available from *Caterpillar Tractor Co.* The 80-hp. wheel loader has a 1¼-cu. yd. bucket and reportedly has quick response performance, operator safety and convenience, ease of servicing, and versatility. (317)

A NEW DESIGN IN WIRE ROPE, developed by *Macwhyte Wire Rope Company*, is described in a folder available from the company. The rope reportedly combines the flexibility of 8-strand rope, the fatigue-resistance of 6x37 rope, and the ruggedness of 6x19 rope. (318)

INDUSTRIAL WIRE CLOTH AND SCREEN specifications are set forth in a comprensive loose-leaf catalog available from *The Cleveland Wire Cloth and Manufacturing Company*. Bulletin 160 details Cleveland's weaving and fabricating facilities outlines specific data needed when ordering. Bulletin 160SM contains complete specification tables and illustrations of square mesh wire cloth from 1 in. center to center, through 250 mesh. Bulletin 160SC provides complete information for square opening space cloth from 4-in. openings through ⅛-in. openings. Bulletin 160RD gives such data as screen characteristics, weight conversion tables, U.S. standard sieve series, square to round equivalents, decimal equivalents, and equations for calculating weights of wire cloth and clear or space openings. (319)

Material listed here is FREE unless otherwise noted.

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Company _____

Address _____

City _____ Zone _____ State _____

Type of business and products _____

*U. S., U. S. Possessions, and Canada only.
Pan American countries, $10 a year; elsewhere, $15 a year.

Enter 219 on card, page 217 →

Hooking up the holes proceeds without danger of premature detonation from stray electric currents.

Delay connectors are attached to Primacord downlines; LEDC trunklines are cut and crimped into these connectors.

The dual connections are taped securely together and the ends of the Primacord downlines are tied.

ENSIGN-BICKFORD LEDC helps solve blasting noise problems at General Crushed Stone Quarry

The Glen Mills Quarry of the General Crushed Stone Company at Glen Mills, Pa., is located in the heart of a residential area. *And its neighbors don't like noise!*

The quarry produces aggregate from hard granite gneiss, very blocky and seamy. High explosives are used with Primacord downlines for in-hole initiation. These downlines are hooked into a surface system of LEDC trunklines and Delay Connectors.

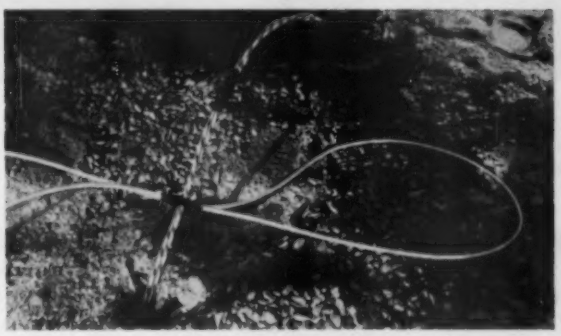
Danger of Prematures Minimized

Blasts are set off at a specified time each day. This means that loaded holes may stand for several hours before blast time. To minimize danger from stray electric currents, the electric blasting caps are never attached until the last minute.

The use of trunklines of Ensign-Bickford Low Energy Detonating Cord has practically eliminated the noise problem—and without danger of premature shots from stray currents.

This blast was set off on December 6, 1960. It consisted of eight 7-in., 50-ft. holes at 15-ft. intervals in a line 20 feet back of the base of a 46-ft. face. Loading was under the direction of Harry Kemery, Superintendent, Morton McGuirk, General Quarry Foreman, and the powder company representative. High explosives were used with two primers in each hole, initiated by Plastic Wire Countered Primacord downlines.

A continuous line of LEDC was laid from Hole No. 8 to Hole No. 1 and back again, forming two trunklines. Delay Connectors were attached to each downline, and the trunklines were cut and crimped into the Connectors, which were then taped securely together.



Two Electric Blasting Caps were taped onto the Primacord downlines at No. 1 Hole, which fired instantaneously. Succeeding holes were progressively delayed 15 milliseconds.

Noise was no problem! . . . just the normal thud of explosives breaking rock.

Ensign-Bickford LEDC is a Low Energy Detonating Cord with two grains PETN per foot, encased in a lead tube and protected by a plastic jacket. It detonates throughout its entire length at nearly four miles per second, but detonation noise is *low*. 150 feet of LEDC makes no more noise than a single blasting cap!

LEDC will not directly initiate Primacord or other cap-sensitive explosives. It is used with connectors developed by E. I. du Pont de Nemours & Co., Inc. LEDC is made only by Ensign-Bickford. Both are available through all explosives manufacturers.

If you have blasting noise problems, LEDC may be the answer. Write for free bulletin; also a free copy of the new Primacord catalog and manual is available through your explosives manufacturer—or write giving your company name.

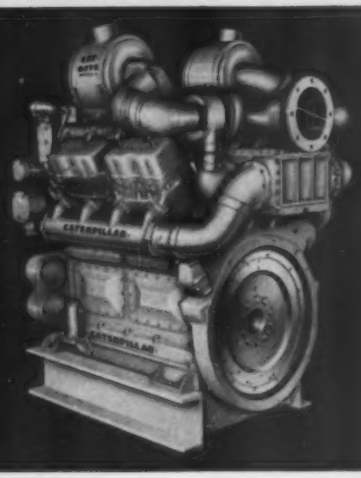
THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

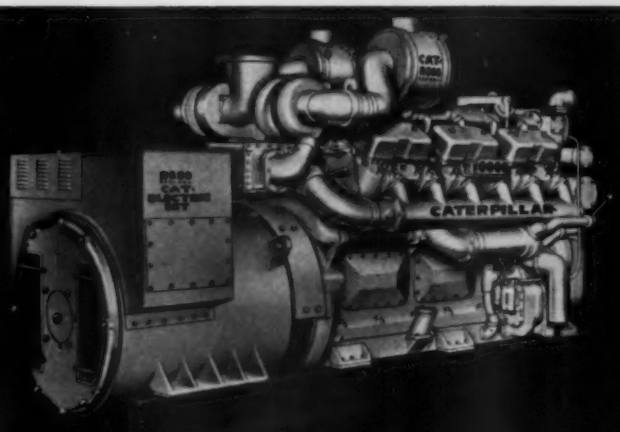
E-B

engine power BY CATERPILLAR

new Cat D398-D379



Cat D379 Industrial Engine. The 6.25" bore, 8.00" stroke D379 and D398 both offer the latest in attachments including marine gears and generators. The D379 Electric Set develops up to 350 KW continuous, 400 KW standby.



Cat D398 Electric Set. The D398 Electric Set shown here with Static-Regulated, Static-Excited Generator features a new generator with built-in static excitation system with no exciter generator or vibrating parts. Develops 500 KW continuous, 600 KW standby.

Give more horsepower per pound, per dollar than any other industrial engine in their class

The V12 D398 and the V8 D379 are rated at 950 and 630 maximum HP, respectively. Electric set versions reach to 600 and 400 KW. Marine ratings exceed 1000 HP. These engines are now available at prices that are less than crankshaft replacement prices of some competitive engines in their class.

Published list prices show the D398 to be thousands of dollars less than the next lowest priced industrial engine that will develop comparable horsepower. Other advantages are quality aluminum alloy bearings, aluminum pistons with cast-iron ring band for top two compression rings, drop forged-dynamically balanced crankshaft and high strength rigid block. These engines save in space and weight, too . . . with at least 35-40% less size and 4800 pounds less weight than other makes with comparable horsepower.

Here are more reasons why Cat D398 and D379 Diesels and Electric Sets give you extra value

NEW PERFORMANCE STANDARDS

- Turbocharged-Aftercooled design
- Static-Regulated, Static-Excited Cat Generators
- High flow lube and water systems
- Ability to burn wide range of fuels

NEW ENGINE FLEXIBILITY

- 100% HP from either end of engines
- Six available accessory drives – up to 50 HP each
- Controls available for either side
- Standard (counterclockwise) rotation or opposite rotation

NEW SERVICE EASE

- Fuel or lube filters serviced from either side
- Remove heads without disturbing manifolding
- Easily inspect or remove pistons, rods and bearings through large side ports
- Externally mounted oil pumps for easy inspection and maintenance

For complete specifications on the D398 and D379 Diesel Engines or Electric Sets, contact your Caterpillar Dealer or Caterpillar Engine Division, Peoria, Illinois.

CATERPILLAR

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Caterpillar Tractor Co., Engine Division, Peoria, Illinois, U. S. A.

Five shots in a 1¼" circle at 50 feet. Faster. And quieter.

(Fired by the Ringblaster® Kiln Gun)

Highest accuracy plus the extraordinary smashing power of Western Super-X Industrial Ammunition are the reasons why Ringblaster helps to keep more rotary kilns productive than any other kiln gun in use today.

The Ringblaster is a rock-solid firing platform to which both bead and bore sights have been added, making it a precision instrument for demolishing kiln clinker rings with the fewest possible shots. It's fast too. A short stroke action and streamlined loading procedure give it a rate of fire that approaches "automatic." (Also quieter. It's the first kiln gun factory-equipped with a sound reducer.)

Note to plant managers: the power you buy is the power that's delivered to the clinker rings. Western's patented cup-wad seals the explosion gases behind the lead slug. There's almost no blow-by. Another exclusive Western development is the impregnated capsule that surrounds the slug. It virtually eliminates lead buildup in the barrel and the sound reducer. Hundreds of thousands of test rounds have proven that barrel life is increased up to 200%.

The Ringblaster has accuracy, power, speed of operation: that's what keeps kilns economically productive. Write us for details on the Ringblaster and the availability of shells designed for your specific needs. ***Ramset®***
Fastening System

WINCHESTER-WESTERN DIVISION **Olin** WINCHESTER AVE., NEW HAVEN 4, CONN.

The Lorain Moto-Matic transmission is simple, easy to get at.

Lorain Moto-Loader Model ML-309 equipped with a 3-yd. bucket loads out rock at the quarry face of the Lincoln Stone Company, Joliet, Illinois.

ML-309 Moto-Loader with ***MOTO-MATIC**** does more for you.

**The new transmission with strait-thru, 4-speed, full power shifting*

At that critical moment when you are coming out of the pile or bank with a load, and want a higher speed for long-haul carry—that is when you will appreciate Lorain's Moto-Matic transmission.

A flick of the hand power shifts into all speeds—even from second to third—without stopping. You truly have a time-saving, 4-speed transmission, not 2 sets of 2 speeds as on other makes. You don't have to make a speed range decision and then stick with it even though it may be too low for maximum travel speed or too high for digging effort. Quick as a wink you can use all 4 speeds to put more material into the trucks.

Other "Moto-Matic" advantages.

1. **Transmission ratios and planetary axle drive ratios** are coordinated for real, balanced performance—whether for digging tractive effort or high speed travel.
2. **Change direction and speed with one foot** . . . no hands required as one foot alternates between two pedals to select forward or reverse and speed. Both hands freed for other controls.
3. **Easy to service** because there are fewer parts than other designs—easier to get at, with standard tools.

This new idea in power-shift transmission is a major reason for the outstanding performance of the Lorain ML-309 Moto-Loader. *But it is just one reason.* There are many more. Your nearby Moto-Loader distributor will be glad to give you all the facts.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®

DOES MORE FASTER • FOR LESS

PLANTS in Lorain and Elyria, Ohio.
PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from 3/8- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 11,000-lb. to 18,000-lb. lifting capacity.
OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

A human mistake... but would your bag survive it?

Human error is only one reason for bag breakage. You can't stamp it out. But you can minimize the damage. How? Improve the strength of your bags *without increasing the paper weight.*

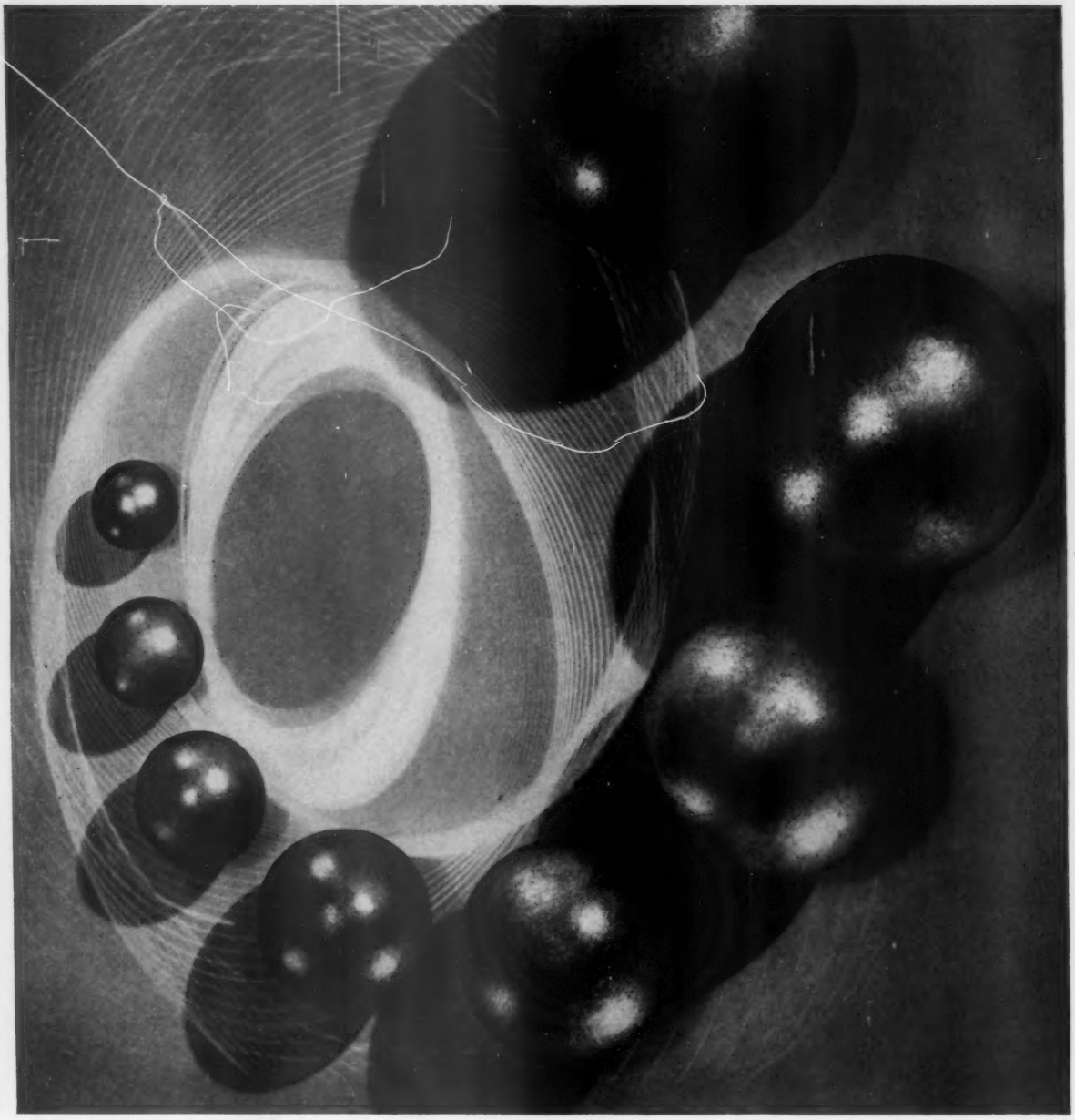
Case in point: the Farm Belt Fertilizer & Chemical Company, Kansas City, Missouri. Recently, this company switched from a four-ply, 180-pound basis weight bag of regular kraft to a three-ply, 150-pound basis weight bag made of Expanda-Kraft—H&W's new, high-strength bag stock. Result: bag breakage during packaging and handling was reduced *40 percent.*

Expanda-Kraft is strong and resilient, because it's made by H&W's roll-crepe process. This production technique gives it two-way stretch. In fact, Expanda-Kraft has the highest *cross-direction* stretch of the leading extensible papers now on the market. With two-way stretch Expanda-Kraft, a bag can absorb rough impacts from any direction.

H&W does not make bags. But we'll be glad to put you in touch with reliable bag manufacturers. For additional information and samples, write Hollingsworth & Whitney, 230 Park Avenue, New York 17, N.Y., or 111 W.Washington St., Chicago 2, Illinois.

EXPANDA-KRAFT®

Hollingsworth & Whitney Division
SCOTT PAPER COMPANY



CF&I controls grinding ball quality all the way

As an integrated manufacturer, CF&I has an opportunity to exercise careful quality control at every stage of grinding ball manufacture, from the mine to the finished product.

The result is forged alloy and carbon steel balls that have outstanding hardness (resistance to wear), toughness (resistance to impact splitting), uniformity of roundness and uniform density. These uniform physical properties mean better milling results for you—the user.

CF&I Grinding Balls are available in the following range of sizes: Forged Alloy Steel Balls—1½″ to 4″ in diameter; Forged Carbon Steel Balls—¾″ to 5″ in diameter.

Other quality CF&I Steel Products for The Cement Industry
Grinding Rods • Mine Rails and Accessories • Rock Bolts • Realock
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BAY CITY
digging ability pays off in rock like this!

Any shovel can load out gravel! But what kind of output would you get in rock like this? It's tough digging — no doubt about it — and certainly no place for an ordinary excavator. Yet, it's a made-to-order situation for BAY CITY digging ability. Here's why:

BAY CITY'S one-piece continuous chain crowd, from front drum through automatic chain adjuster to shipper shaft, provides a powerful crowd-out action. Independent of all other functions, the crowd action gives the operator positive, accurate control of the dipper at every point in the digging cycle. Retract is power-operated, at twice the crowd-out speed, and provides positive handle-control throughout the cycle.

Simple, trouble-free, instantaneous controls mean faster operation, peak production. Mechanical power-controlled boosters actuate drum clutches with minimum effort. The sure, smooth engagement of the large diameter swingers rotates machine and load with a smooth, gliding motion . . . assures careful dumping of load, reduced spillage.

The digging ability of a BAY CITY can be yours. Why not take advantage of it? Stop in to see your BAY CITY dealer soon and explain your pit needs to him. He handles ¾- to 1½-yd. excavators, and will gladly give you the complete story on the size you need.

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(A subsidiary of UNIT CRANE & SHOVEL CORP.)

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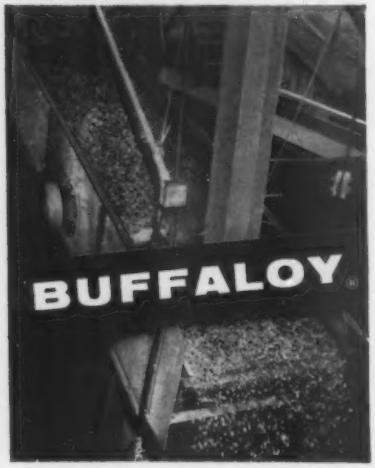
LOWEST COST PER TON



anti-abrasive wire cloth

Here's the toughest mineral aggregate screen in the business . . . outperforming and outlasting screens that cost appreciably more. Specially processed for greatest resistance to wear, Buffaloy has both the hardness to hold up under severe abrasives and the flexibility to shrug off heavy shock loads.

Count on Buffaloy for many extra hours of service and substantial savings in your screening operations. Vastly superior to other high carbon wire screens, it is made in two grades:
Regular . . . for average conditions.
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Now available in an extra wide selection of weaves, mesh sizes and gauges — either as flat pieces or vibrator screen panels with special edges — Buffaloy can answer your every sizing need.

Get the complete story on Buffaloy and what it can do for you. Write for New Bulletin 600P.

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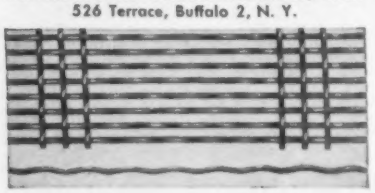

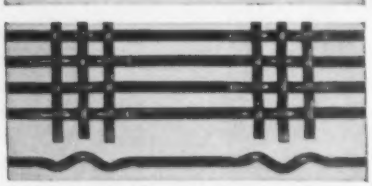

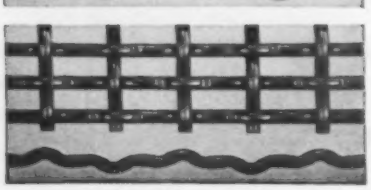

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Legal Decisions

On Industry Problems

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

DURING the past few weeks the writer made special effort to collect outstanding higher court cases which involve manufacturers.

For example, it has been customary in different states for law making bodies to exempt buyers and sellers from payment of sale and use taxes on merchandise, machinery, and equipment used for manufacturing and processing of salable products. Last month a higher court rendered an unusually important decision on the legal effect of sales and use tax exemption state laws on concrete products. I shall review this outstanding higher court opinion and decision in considerable detail.

For instance, in *Holderman* v. *Bowers,* 170 N. E. (2nd) 65, a state law which exempts from the state's sale and use taxes all machinery and equipment purchased and used by a taxpayer in the manufacture and processing of salable products was litigated.

The testimony showed that a company is engaged in constructing and building concrete highways and roads. Further testimony showed that near the site of the company's operation, sand and two kinds of aggregates (fine and coarse) are stored in piles on the ground, where the aggregates are saturated with water by means of a sprinkling system. The moistened aggregates and sand are then lifted and transferred, as needed, in the clamshell bucket attached to the crane, to an "aggregate" batching plant, where they are measured out in predetermined amounts, and then discharged into a truck underneath the batching plant.

From the aggregate batching plant, the truck moves to a cement batching plant. At this point cement is measured out in the required amount and placed in the truck with the aggregates. From there the truck moves to the concrete mixer which produces raw concrete. This concrete is then distributed over the roadbed from a distributing bucket attached to the mixer. After being distributed, the concrete is worked by a spreader which operates to agitate the concrete to create an even texture. The flexi-finisher follows the spreaders, and behind them is a curing machine which further processes the concrete by impregnating the surface with a liquid membrane curing compound which makes the concrete dry and firm. After these processes are completed, the concrete strip is sawed to cut joints which are filled with a heated bituminous material to prevent cracking of the concrete due to expansion and contraction.

The lawyers contended that the company need not pay sale or use taxes on the larger items, including a machine crane, a clamshell bucket and a cement elevator. This contention was based upon the argument that the processing or manufacturing begins with the water saturation of the piles of aggregates. Because it is necessary for efficient operation of the plant that the mix be wet before the cement is added, so that the concrete would not be too dry for use, it was therefore claimed that all items used in the batching plant operations are exempt from sales tax.

The higher court refused to agree with these contentions and held taxable the various items, including the crane, clamshell bucket, and cement elevator used prior to commingling of various raw materials. In this respect, the higher court said:

"We are of the opinion that the mere addition of water to gravel

HEIL-TEC dump trailers

Exclusive design cuts dead weight...lets you haul up to 4,000 lb more payload

HY-SPILL dump trailers increase the versatility of your hauling rig. *Exclusive, patented design* holds front tandem wheels on ground during dumping, provides 38 to 40-in. spill height from end of body floor to ground. Clearance is ample for high stockpiling, dumping into above-ground hoppers and paving and spreading machines.

Exclusive design of TEC frameless dump trailers—engineered for maximum strength and stability with minimum tare weight—saves 1,000 to 2,000 lb per unit compared to conventional frame-type trailers. TEC frameless dump trailers can be furnished in long lengths to permit forward location of lower fifth wheel on tractor, and also obtain long extreme axle spacing as required in many states. *Payload can be increased as much as 4,000 lb* in certain states . . . and even more where longer axle spacing is desirable.

Aluminum boosts payload

With aluminum construction, you can haul an extra 2,400 to 3,000-lb payload. Weight-saving HY-TEC and HY-SPILL design and aluminum construction actually can soon pay for itself in increased income.

TEC builds single axle and tandem semi-trailers for use with either single axle or tandem tractors. Single axle trailers are available in body lengths from 16 to 28 ft, and tandem axle units in lengths from 20 to 34 ft.

TEC design gives you on-the-job advantages

- **Exclusive HY-SPILL design permits dumping into high hoppers, paving and spreading machines.**
- **Body can be raised or lowered while moving, with better stability than any other hauling unit.**
- **Trailer can be dumped while jackknifed, speeds dumping and turn-around in tight places.**
- **Excellent balance and maximum stability let you haul and dump safely and efficiently on rugged job sites and off-highway conditions . . . anywhere your truck can go.**

Fleet of HY-TEC dump trailers operated by a large Midwestern sand and gravel producer. First two units in foreground are aluminum.

HY-TEC FRAMELESS TYPE
U.S. Patent No. 2,846,267

HY-SPILL FRAMELESS TYPE
(Available Only From Heil)
U.S. Patent No. 2,853,341

TEC Division **THE HEIL CO.** DUMP BODIES and HOISTS

TEC Division, 1285 West 70th Street, Cleveland 2, Ohio

550° F gas filtered by Glastube collector at Perlite mfg. plant

A demonstration of WHEELABRATOR'S

VITAL VALUES

Development of a residential neighborhood near an Eastern perlite manufacturing plant, meant the firm could no longer exhaust fine perlite dust into the air. With temperatures of 550°F involved, only a dust collector utilizing glass fiber tubes would handle the problem. To this challenge Wheelabrator engineers brought the Vital Experience of having used successfully more glass fiber tubes than any other dust control equipment manufacturer. With the installation of a Wheelabrator Glastube Collector, local air pollution control requirements were satisfied. You, too, can depend on Wheelabrator's Vital Values to assure solution of your Dust problems with optimum efficiency and economy.

Fine perlite dust in gas up to 550°F is captured in this Glastube Dust Collector to eliminate an air pollution problem. Write today for detailed data on this hot gas application.

VITAL VALUES FOR INDUSTRY

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WHEELABRATOR CORPORATION, 1280 S. Byrkit St., Mishawaka, Ind.
In Canada, WHEELABRATOR CORP. of Canada, Ltd. P.O. Box 490, Scarborough, Ont.

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does not constitute the start of processing or manufacturing of concrete and that the processing or manufacturing of concrete did not start until after the various raw materials were commingled in the body of the truck and dumped in the concrete mixer. It is our further opinion that the processing or manufacturing engaged in by appellant (Holderman Company) did not end until after the concrete was scored with the saw blades here in issue, and that all the equipment used in the forming and spreading of the concrete was used directly in processing concrete for sale."

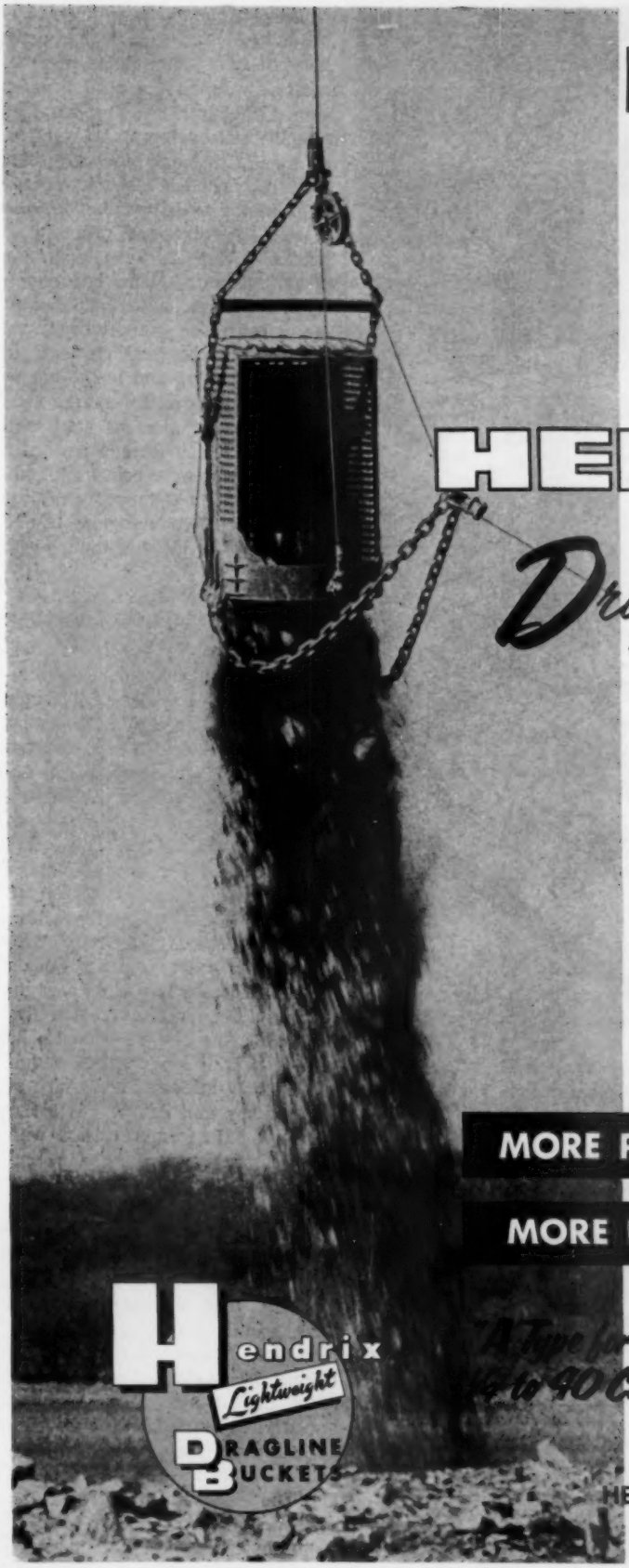
On the other hand, the Board of Tax Appeals held the flexi-finisher, road forms, spreaders, and saw blades exempt from the sales and use taxes because they were used directly in processing or manufacturing.

The Tax Commissioner argued, without any effect on the court, that these items are not exempt from taxation on the contention that the concrete which the company produced was fully processed and marketable by the time it was dumped on the ground, and the forms, spreaders, flexi-finisher, and saw blades which were used to spread and finish the concrete into the road surface were used to produce a highway, which was affixed to the land as a permanent accession thereto.

The higher court held that these items are exempt from sales and use taxation, and said:

"The record contains testimony that after the concrete is dumped and spread it has to be further treated by physical means to bring back to the surface the mortar and moisture in order to transform the rough irregular finish to a smooth even finish; that this is done by the flexi-finisher and spreaders, which agitate the fresh concrete by the transverse motion of "screeds"; and that, after the surface is smooth, it is treated with a curing compound and scored with saws. The record shows also that the concrete does not become so firmly affixed to the ground that it can not be removed for approximately 24 hours. The finding that the processing continues until the concrete is scored with saw blades within that period is also supported by credible testimony."

For comparison, see *Youngstown*



PROFIT HEAVY

HENDRIX

Dragline Buckets

The Hendrix Bucket design and scientifically-arranged perforations eliminate excess bucket weight to allow more payload *inside*, where it belongs, for . . .

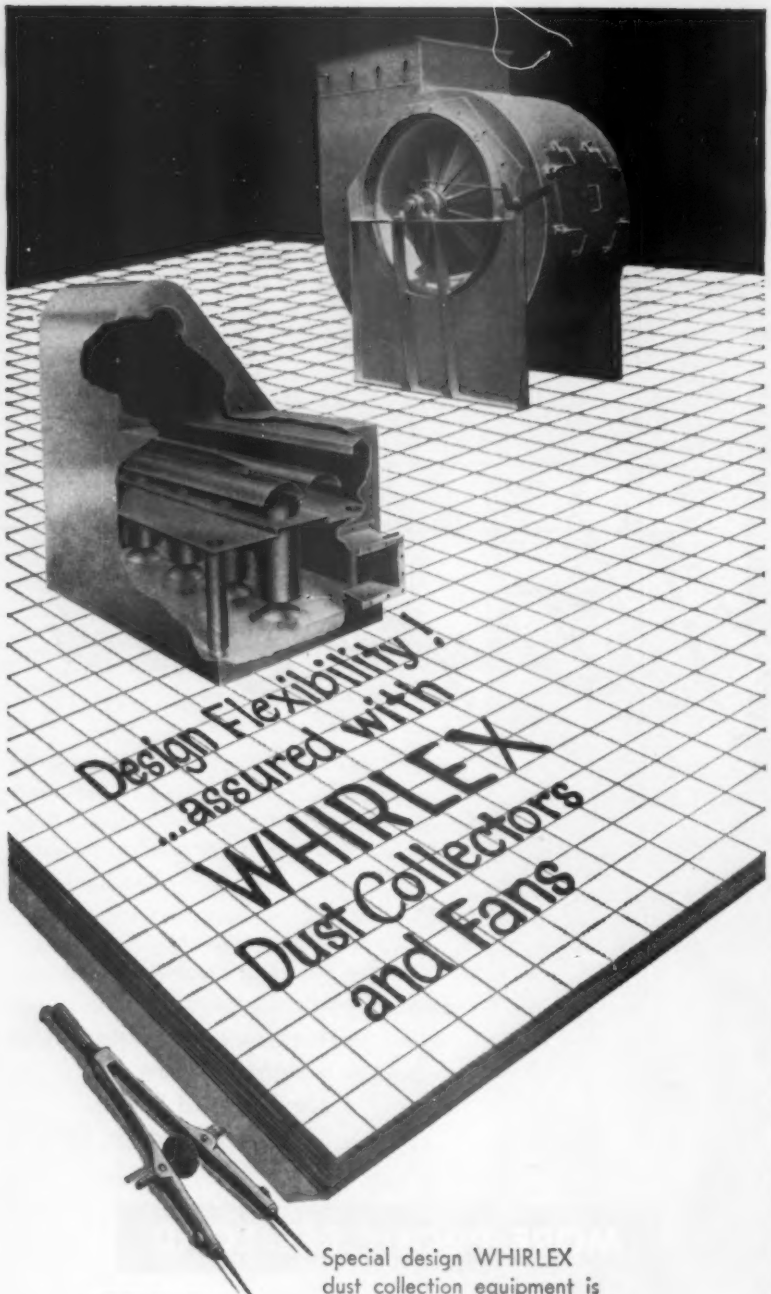
MORE PROFIT PER LOAD

MORE LOAD PER CYCLE

Hendrix Lightweight DRAGLINE BUCKETS

"A Type for Every Digging Purpose"...
½ to 40 Cubic Yards–Perforated or Solid

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA



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Special design WHIRLEX dust collection equipment is operating efficiently over most of the world. Special designs for special applications are a specialty with WHIRLEX!

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Bag Collectors — Mechanical Collectors — Wet Collectors
Induced Draft Fans — Forced Draft Fans — Exhaust Fans
Self Supporting Stacks — Duct Work

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Building Company v. *Bowers,* 149 N. E. (2d) 1. This higher court held that, in determining whether personal property is used or consumed directly in the production of tangible personal property for sale by manufacturing or processing, and, therefore whether its sale or use is exempted from taxation, the test is not whether such property or chattels is essential to the operation of an "integrated plant" but the test is when does the actual manufacturing or processing activity begin and end, and is the property used or consumed during and in the manufacturing or processing period.

In that case, bins to hold sand and stone which formed part of a batching plant were held taxable on the ground that they were used "prior to the commingling of the ingredients in the common weigh hopper."

Must Have Notice

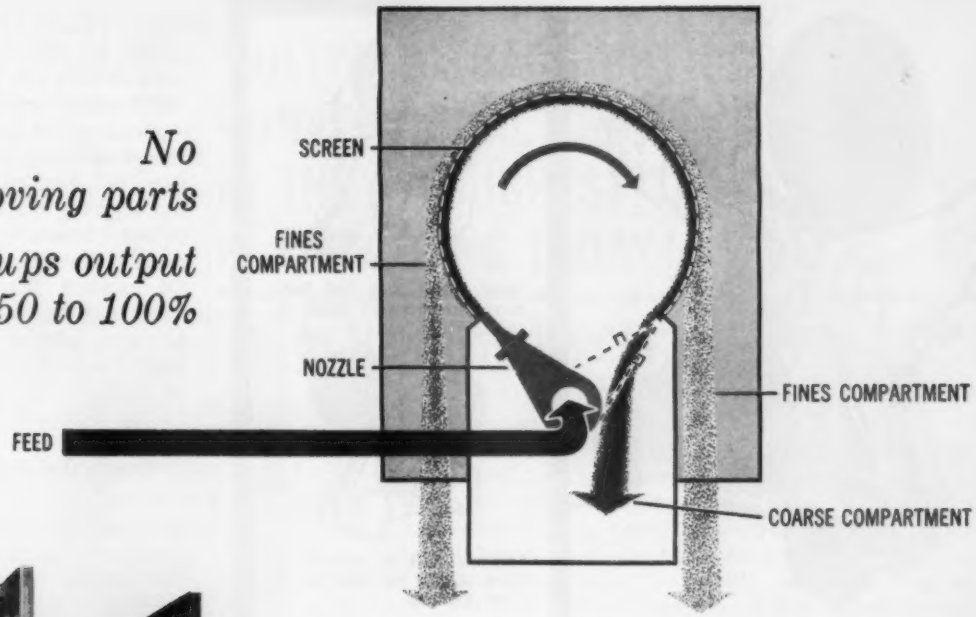
Generally speaking, a court will not award compensation to an employee who alleges that he sustained an injury in the cause of his regular employment, unless testimony from disinterested witnesses verify occurrence of the alleged injury.

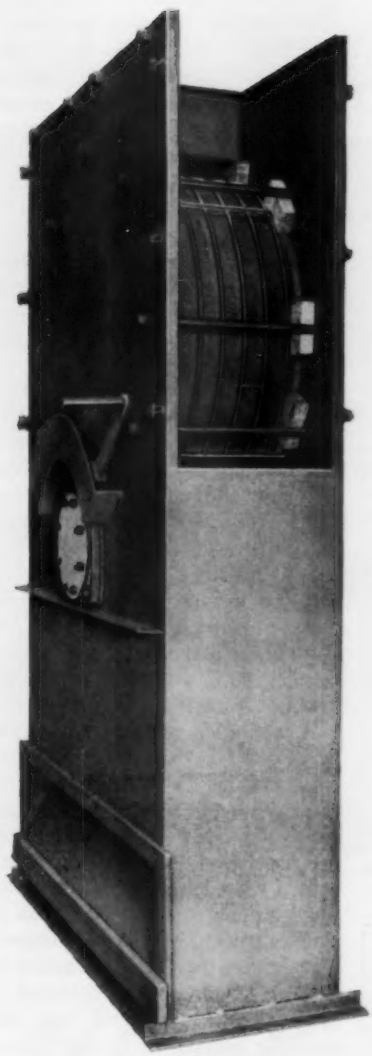
For illustration, in *Bender* v. *Round Company,* 356 Pac. (2d) 469, an employee named Bender claimed that he sustained a severe injury while attempting to remove some rock, a piece of the rock broke off, causing him to slip and fall on his back, thereby wrenching and injuring it. Bender claimed that five days after the alleged accident he went to pick up his paycheck and at this time he informed one Clark of the accident and injury. Thereafter Bender filed a formal petition with the Industrial Board requesting compensation.

At the hearing, Clark, who was a "former" president of the company, testified that he did not recall the incident, or that he would have reported it to the employer. The board refused to award Bender compensation in view of the fact that neither the employer, his managing agent, nor superintendent in charge of work had actual knowledge of the accident and injury to Bender who had given no timely notice in writing. The higher court approved the verdict, saying:

"It must be pointed out that ap-

No moving parts —ups output 50 to 100%





The Dorr-Oliver

270° DSM SCREEN

for the raw cement grinding circuit

A unique development of the revolutionary DSM Screen now makes possible simplified removal of virtually all tramp and plus 48 mesh material from the raw cement mix. The equipment has no moving parts and uses no power apart from that required for the feeding operation. Users report improved burnability through efficient screening of kiln feed and increases in mill output between 50 and 100%.

The screen is of a unique wedge bar design, arranged to form a 270° cylindrical segment. Feed is supplied by a flat nozzle at sufficient velocity to travel around the interior of the cylinder. Fines pass through the bars to the outside for collection, while tramp and coarse material remain inside and fall to a separate compartment for discharge.

The equipment is fully enclosed, simple, rugged and compact. It operates continuously without attention. Arrangements are made for reversing the direction of flow from the nozzle to equalize bar wear. For information on this unique advance in mill screening, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

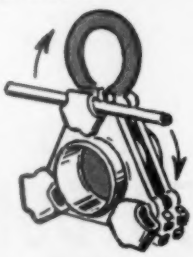
DSM – T.M. Reg. U.S. Pat. Off.

DORR-OLIVER

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

Spool shaped nuts and bolts spread flanges when turned to the LEFT with bar.

Spectacle plate is reversed by lifting slightly and revolving in either direction.



Flanges are tightened by turning bolts to RIGHT.

The easiest, quickest way to blind a cement line . . . with absolute shut-off

HAMER 3-BOLT LINE BLIND VALVE

There's no danger of contaminating different grades of cement when your silo loading lines and laterals are equipped with Hamer 3-Bolt Line Blind Valves. An absolute shut-off is obtained in just a few minutes by one man. By backing off three bolts with a bar the spectacle plate is ready to swing from open to closed position and you have a solid-plate, leakproof, shut-off. Hamer Line Blind Valves can't wedge, jam, or stick.

Use Hamer's on slurry or dry cement lines. They require minimum maintenance . . . are unsurpassed for positive action, easy operation, long-life, and resistance to abrasion. Ask your Hamer Valve specialist for complete information or write for latest catalog.

WECO WELL EQUIPMENT MFG. CORP.
HOUSTON, TEXAS
Division of CHIKSAN COMPANY a subsidiary of FOOD MACHINERY AND CHEMICAL CORPORATION

NV-1-61

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pellant (Bender) and his wife had a direct pecuniary interest in the outcome of the claim and were in serious financial straits at the time of the hearing. We cannot say that the Industrial Board and the trial court were not justified in disregarding and rejecting the testimony of appellant (Bender) and his wife. It is quite true that on the night of the accident Bender, the injured miner, did not inform the foreman or anyone else in authority at the mine. Bender testified that on going off shift that that night he did not see the foreman."

Watch Out for Regulations

A few days ago I received an inquiry from an official of a concrete products corporation, as follows: "We operate many motor trucks which are within the scope of rules and regulations of the Interstate Commerce Commission. Are we subject to these rules and regulations without advance notifications, or knowledge?"

The answer definitely is in the affirmative. In other words, motor truck owners and also companies which service vehicles are subject to all valid rules and regulations of the Interstate Commerce Commission without advance notifications or knowledge of such rules and regulations.

For example, in *Jack Company* v. *Griffin,* 356 Pac. (2d) 748, the testimony showed that the Interstate Commerce Commission has a regulation which requires that the nozzle of a gasoline hose used to inject gasoline into a motor truck tank must be kept in contact with the saddle tank when the motor vehicle is being filled with gasoline. To the average layman this is an unknown, unusual, and unnecessary regulation. However, it is based upon practical experience.

The testimony showed that a gasoline attendant failed to comply with this regulation and gasoline became ignited while the attendant was putting gasoline in the saddle tank of a motor truck. The testimony showed further that the fire was caused by a static spark which originated at the opening of the saddle tank and that the static spark was caused by gasoline flowing against the side of the saddle tank.

In subsequent litgation, the high-

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1 In Handling And In Transit!

CLUPAK extensible paper introduces a new dimension to multiwall bag performance: the ability to *stretch under strain.* When subjected to truck and box car manhandling which often destroys ordinary bags, these tougher multiwalls arrive intact, thus reducing product waste and damage. Order a trial shipment of CLUPAK extensible paper multiwalls – see how they outperform conventional bags of higher basis weight.

2 In The Warehouse!

New CLUPAK extensible paper reduces waste – even saves space – in your warehouse! That's because impact and strain which destroy conventional kraft are *absorbed* by multiwalls made from stretchable, flexible CLUPAK extensible paper. They can be stacked higher, shifted faster, and handled rougher than ordinary bags – with little danger of splitting or bursting. This extra toughness enables you to use multiwalls of lower basis weight – another saving!

3 On The Filling Line!

Two major filling line problems, breakage and uneven filling, are substantially eliminated by multiwalls made from CLUPAK extensible paper. Remarkably flexible, they fill quickly and uniformly. And because these tougher multiwalls have greater impact strength – the ability to *absorb* shock – they resist rough treatment that tears conventional bags. Breakage is reduced, repackaging minimized, production speeded! Try multiwalls made from CLUPAK extensible paper, soon!

Prior to CLUPAK extensible paper, there were no controlled standards of toughness in the paper industry. Clupak, Inc., is proud to have established these standards and permits the use of its trademark only on paper which meets these rigid toughness requirements.

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Ask your salesman about this revolutionary new material... prove to yourself that multiwall bags made of CLUPAK extensible paper give you...

GREATER STRENGTH WITH LOWER TOTAL BASIS WEIGHT

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N.Y. 36, N.Y.

er court held the truck owner liable in heavy damages resulting from the fire. This was so although the service station attendant had no actual knowledge of the above mentioned Interstate Commerce Commission regulation, and the truck's tank was not being filled under the supervision of the truck driver when the fire started. This court said:

"The driver of the truck did not give the filling station attendant instructions relative to flowing gasoline into the saddle tank . . . It was not necessary to show that a static spark was actually produced; but it was sufficient if conditions and circumstances were shown from which the inference could be reasonably drawn that a static spark was produced."

This higher court went on to explain important facts to the effect that static electricity is created by two different and distinct materials coming in contact with each other. Gasoline coming in contact with the side of a saddle tank causes static electricity to build up. As long as a continuous contact is maintained between two separately charged materials a static spark will not occur and, therefore, if the nozzle of the hose is kept in contact with the sides of the saddle tank a static spark will not occur.

Avoiding Excessive Losses

A reader wrote, as follows: "Some time ago you wrote about several large damage allowances made by recent courts to injured employees. I have lost these pages. Please give me further information on this law and the reason for these large damage awards, and how I can protect myself against damages payable to injured employees."

During my over 35 years of active law practice I have known many smart business persons who amassed fortunes through their keen business judgment and ability, and who finally lost their entire fortune because of inefficient and poor insurance protection.

For example, in a recent higher court case one White was liable in $100,000.00 damages for injuries to an employee because the former failed to abide by a state law designed to protect employees from injuries. This employer had only $50,000.00 insurance, and so he was compelled to pay out of his own pocket the sum of $50,000.00. For a few dollars more he could have had full insurance protection.

In another recent case an employer was held liable for $136.-000.00 to an employee injured while using the employer's defective appliance. This employer had only $75,000.00 insurance protection.

In another case a concrete products corporation was held liable in $87,575.00 damages for injuries to a customer caused by negligence of an inexperienced workman. This corporation had only $50,000.00 insurance protection whereby the corporation was compelled to pay $37,-575.00 to the customer.

In all of these cases, the testimony showed that for a few dollars more each year the insured could have had full and complete protection against extra heavy damage allowances, instead of protection against medium or relatively small damages.

Consult your insurance agent and you will learn that full insurance protection costs only a little more

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LA SALLE, ILL. 149,000 BARRELS

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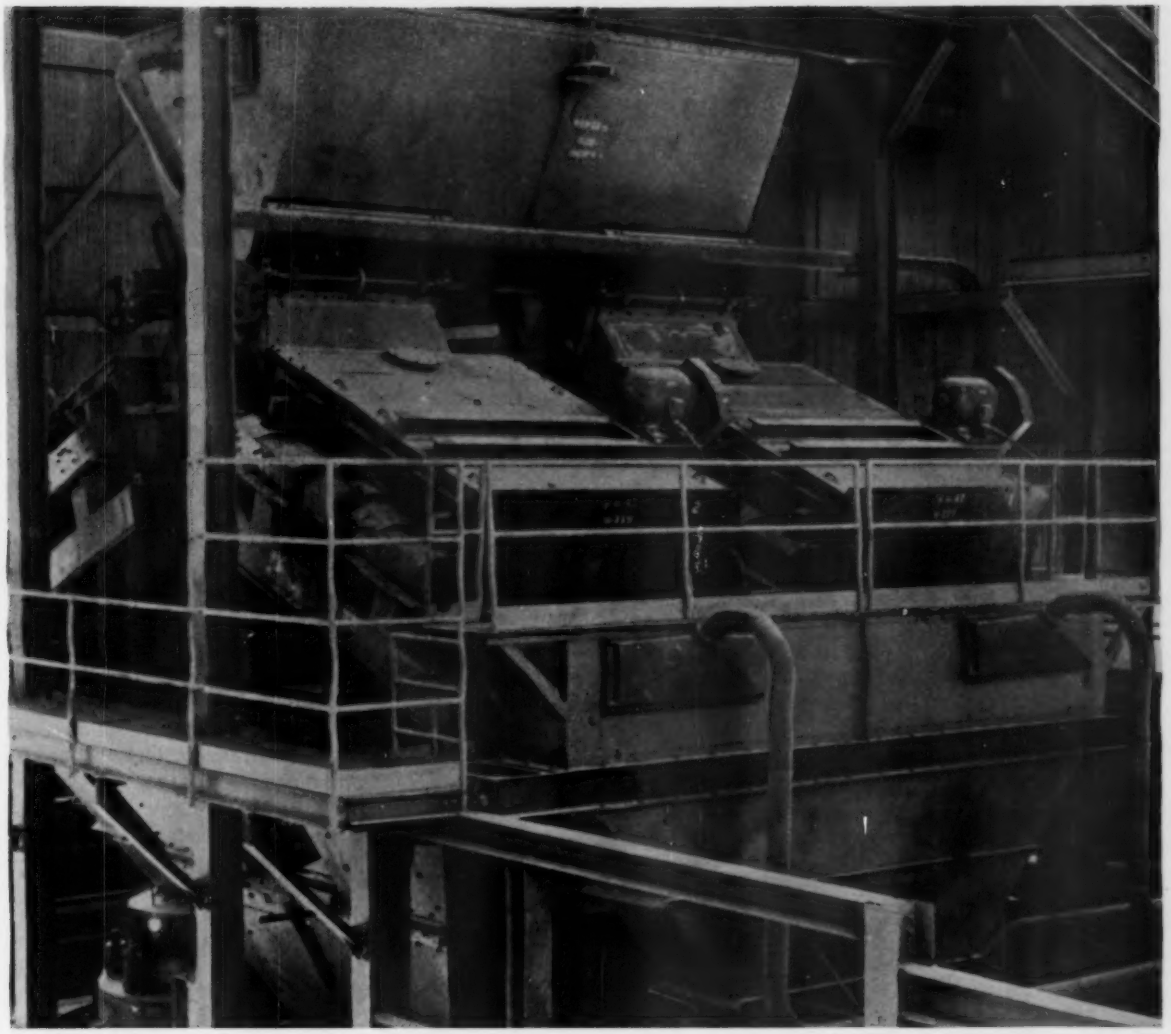
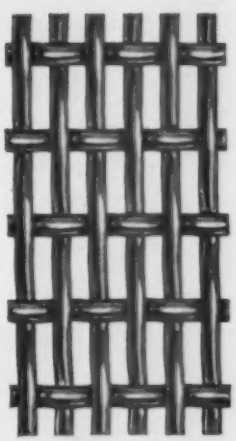


In 7 years of operation Tyler Ty-Rocks screen 15,000,000 tons of ore at Silver Bell Mine..."maintenance virtually nil"

These four single-surface Ty-Rock screens at the Silver Bell Mine of American Smelting and Refining Company have screened mountains of copper ore. Yet in seven years of operation the company reports "no bearing or other major replacements, and maintenance virtually nil"...a tribute to the fine operating staff and to the design of the equipment.

Tyler vibrating screens handle tremendous outputs with very high reliability. And no matter what your screening requirements, Tyler can handle them: heavy duty mechanical screens, electric screens, economical two-bearing screens. And—Tyler is the world's largest manufacturer of wire cloth and fabricated screen sections.

For screening equipment perfectly matched to your needs check with Tyler.



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Law of Gross Incomes

During the past several months I have received inquiries from readers regarding the legal right of processors of materials to include gross income from mining operations in sale contracts in calculating depletion allowances.

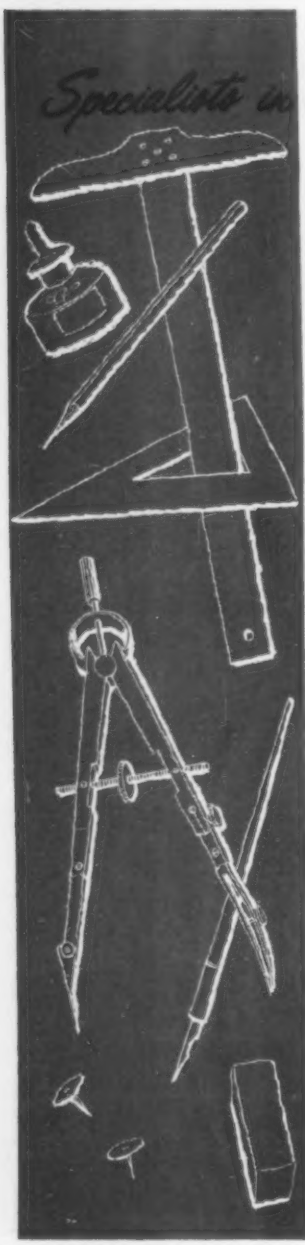
Last month a higher court rendered a decision which quite apparently answers various phases of the law on this subject. Basically this higher court held that the cost of preparation or processing of a product for shipment does not include shipment costs of the material after it is finally prepared.

For illustration in *Winnsboro Granite Corporation* v. *Commissioner of Internal Revenue*, 238 Fed. Rep. (2d) 307, the testimony showed these facts: The Winnsboro Granite Corporation is engaged in mining large and heavy blocks of rough granite stone which are loaded at its quarry on railroad flat cars. These cars then travel fourteen miles on an intrastate railroad to a town named Rockton, an interstate outlet point. At Rockton the cars are switched to an interstate railroad carrier which owns the cars on which the granite stones are loaded. All such shipments of the Winnsboro Granite Corporation are then billed to customers f.o.b. Rockton. No processing of the stone takes place after it is loaded for shipment at the quarry. All the processing necessary to convert the rough stone into monuments is done by the purchasers after receipt of the stone.

The Winnsboro Granite Corporation has an affiliate and wholly owned subsidiary, the Rion Crush Stone Corporation. The testimony showed that the Rion Corporation crushes rough stones into smaller sizes called "aggregates" which are loaded on motor trucks at the quarry. The greater portion of the Rion Corporation's sales is made to the state and other political subdivisions which generally require that transportation costs to the job site be included in the bid price. The Rion Corporation sold aggregates at a price fixed at the quarry and the transportation cost was then billed separately to the customer. The aggregates undergo no treatment processes after they are loaded at the quarry.

The legal questions presented to the court are whether transportation costs incurred by the Winnsboro Granite Corporation to the railroad shipping point at Rockton (and included in the sale price of the stone to the customers) and the costs of transporting aggregates to a contract designation by the Rion Corporation (as included in its bid price for delivery at job site) are properly included in the "gross income from the property" for the purpose of calculating the mining depletion allowance.

The pertinent statute provides that the gross income from the stone and chattels for the purposes of computing percentage depletion means "gross income from mining." The term "mining" as used therein includes not only the extraction of the mineral, but also the ordinary treatment processes normally applied by the owner and operator in order to arrive at a commercial-



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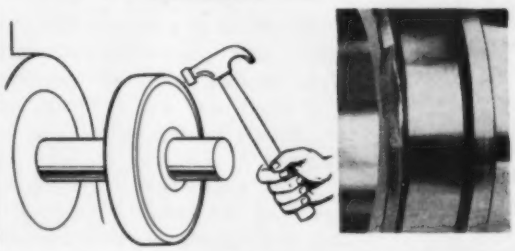
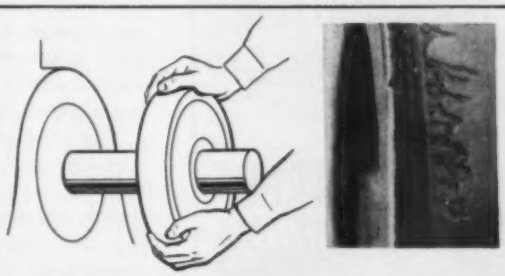
DISTRIBUTOR DAN, the SKF bearing man, lists

THE 5 MAIN REASONS WHY BEARINGS FAIL

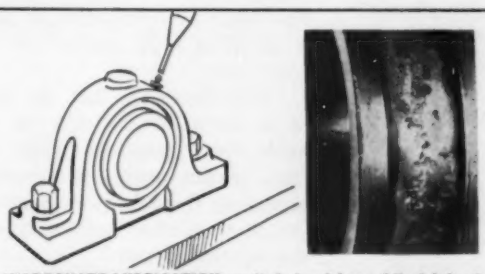
and some helpful tips to eliminate them



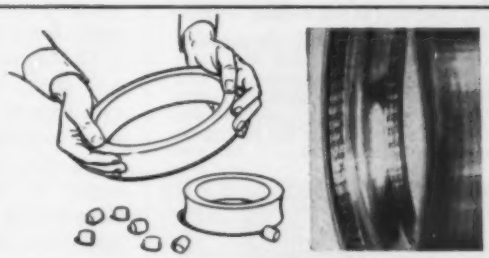
ABUSE DURING MOUNTING. Don't hammer the outer ring of a bearing having an interference fit on the inner ring. Striking the outer ring with a hammer almost always causes denting, brinelling, and even breakage—as shown in the photo at right.



IMPROPER MOUNTING can cause edge-loading and fatigue-flaking, especially in tapered and cylindrical roller bearings. Watch out for off-square mounting or cocking of the inner or outer ring, out-of-line housings or shaft deflection—all of which mean misalignment.



INADEQUATE LUBRICATION results in breakdown of the lubricant by carbonization into a fine abrasive. Heat generated softens the bearing steel and early failure results. So, be sure to give your bearings the right amount of lubricant in the right place at the right time.



DIRT AND OTHER PARTICLES will often cause denting, as shown at right. Even soft particles—brass, aluminum, wood and paper—can dent a rolling surface. Protect your bearings by using effective seals and maintaining cleanliness at all times.

CORROSION CAN START if you wash the bearing in cold solvent and then cover it with a cold slushing compound. The moisture can't evaporate so it expends itself in corroding the steel. To prevent this, immerse the bearing in hot oil or slushing compound and allow it to assume the temperature of the bath.

Baffled by a bearing problem? Whether it's selection, mounting, or maintenance—consult your Authorized SKF Distributor. He's staffed to help you keep them running smoothly and he stocks all the bearing types and sizes you need.

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ly marketable mineral product. Included, by way of definition of the "ordinary treatment processes" in the case of minerals customarily sold in crude form, are the sorting, concentrating, and sintering to bring it to shipping grade and form, and loading for shipment. In addition, transportation costs from the point of extraction from the ground to the plants or mills in which the ordinary treatment processes are to be applied are to be included in "gross income from mining."

The legal counsel for the Winnsboro Granite Corporation contended that the size of the blocks of stone makes shipment by rail necessary; that the monumental stone is not commercially marketable until transportation is applied as an ordinary process to complete extraction; that, since the costs of transportation are included in the price of the stone to its customers, such costs are properly part of the gross income from the property.

The higher court refused to agree with these contentions and held that even though all of such shipments of stone were billed from the switching point, the transportation costs incurred by the Winnsboro Granite Corporation to such railroad shipping point, and included in the sales price of the stone to customers, were not properly included as gross income from mining for purpose of calculating mining depletion allowance. This court said:

"The product it actually sold was the rough granite blocks after they were extracted and loaded for shipment at the quarry. In our view, transportation began at the quarry, there was no reloading for shipment at Rockton and there was no interruption of transportation from the quarry to customer."

The lawyers for the Rion Crush Stone Corporation contended that in the instances where customers require bid prices to include delivery to the job site, the costs of such transportation should be considered as a part of the extraction costs to obtain a commercially marketable product. The higher court refused to agree with these contentions, and stated:

"Rion's products were clearly commercially marketable when loaded at the quarry and transportation was no part of the extraction process. There was no transportation of its products to its plant for application of ordinary treatment processes. The preparation of a mineral for shipment does not include shipment of the mineral after it is so prepared."

Law of Incompetent Drivers

An official of a concrete products corporation asked this interesting legal question: "If our employee gets drunk and has a wreck, can the person injured sue us and get damages?"

A few weeks ago a higher court answered this question by holding that a corporation which employs an 'incompetent" driver of a motor vehicle always is liable in damages for injuries caused by the driver.

In *Krausnick* v. *Haegg Company*, 20 N. W. (2d) 432, the testimony showed that a boy five years old was killed by a motor truck driven by a driver while intoxicated. This court held:

"This theory is that the owner of a motor vehicle may be held liable for a resulting injury to a third person upon the ground of negligence if he knowingly entrusts its operation to an inexperienced or incompetent driver."

This court explained further that when an employer entrusts a motor vehicle to a driver known to be incompetent, the employer always is liable even though the particular use of the vehicle at the time of the injury was beyond the scope of the employer's consent.

For comparison, see the leading case of *Waddle* v. *Stafford*, 230 Pac. 855, where a higher court stated the following important law:

"It is the duty of a man to see that his automobile . . . is in the hands of a skillful and competent person."

Other higher courts have held that a person whose eyesight is defective, and who wears no corrective eyeglasses may be incompetent. Also, a highly nervous person probably would be held to be an incompetent driver of a motor vehicle. Other courts have held that persons who are insane, intoxicated, under the influence of drugs, deaf, paralyzed, or naturally reckless are incompetent motor vehicle drivers.

Manufacturers' News

E. H. CRABTREE, director of the Colorado School of Mines Foundation at Golden, has been elected to membership on the board of directors of Mine and Smelter Supply Co. in Denver.

E. H. Crabtree

For the first time in its 65-year history Mine and Smelter elected directors from outside the organization in an improvement move calculated to broaden the firm's knowledge and capabilities in the fields of research, new product development, and mining technology.

Effective March 17, 1961, the new corporate name of McLanahan and Stone Corporation, Hollidaysburg, Pa., became McLanahan Corporation.

The 126-year old producer of pit, mine and quarry equipment made the name change largely to eliminate the impression that it is a supplier of crushed stone, gravel or other materials, it was announced.

Highlighting its 50th anniversary this year, the Gates Rubber Company, Denver, Colo., has announced construction of its first manufacturing plant in Europe. The plant, containing 126,000 sq. ft. of floor space, will be erected in Erembodegem, Belgium. It will manufacture all lines of industrial hose, V-belts, and molded rubber goods.

RALPH E. HANSEN, vice-president in charge of export sales, will move to Europe to head the sales organization.

HUGH HARRIS, who has been with the company for 15 years, will manage the Belgian manufacturing operations.

The company, which started as a small leather shop in 1911 with an investment of $3,500, has grown to a multimillion dollar, multiplant operation with world-wide sales approaching $150 million annually.

Development in 1917 of the first rubber and fabric V-belt in history at Gates gave Gates a lead in the V-belt field. Tires and molded rubber goods were added to the Gates line in the 1920's. During World War II the Gates factory group was awarded an Army-Navy 'E" in 1942.

Enso-Gutzeit Corporation, reportedly Finland's largest industrial company and the largest paper products exporter in the world, has signed a licensing agreement with Clupak, Inc., New York, N. Y. to manufacture Clupak extensible paper.

WILLIAM J. ANDERSON has been appointed Chicago district sales manager for all products of Macwhyte Wire Rope Company, Kenosha, Wis. He was transferred from general sales to replace former manager GEORGE W. DRYSDALE, now retired.

CompuDyne Corporation, Hatboro, Penn. has entered the telemetering field.

Telemetering is the method of transmitting information to a distant receiver by means of an electronic device that measures pressure, temperature, flow level, etc. In addition to specific equipment being introduced, a full-scale development program will cover all phases of telemetering. The program will augment the efforts of CompuDyne's Process Control and Systems Divisions by providing the final link to tie in control systems for virtually

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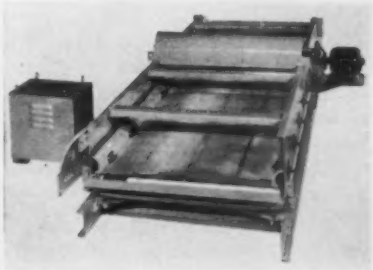

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Misc. Manganese Steel Castings

THE FROG, SWITCH AND MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

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all types of industrial process operations.

MURRAY KRAUS has been appointed product manager. He comes to CompuDyne from Ascop Division of Electro-Mechanical Research Corp. where he was head of telemetering and control. Prior to this he was active in control systems' design and development.

P. T. ROBIN, president of Clamshell Sales Corporation, Long Island City, New York, subsidiary of The Owen Bucket Company, Cleveland, Ohio, has retired after 25 years of service.

FRANK P. D'ANCI has been appointed to fill the vacancy created by Mr. Robins' retirement. Mr. D'Anci joined Clamshell in 1959 as director of distributor sales.

FRANK J. SZABO, recently appointed comptroller of The Owen Bucket Company in Cleveland has been appointed secretary-treasurer of Clamshell Bucket Sales Corp. Mr. Szabo will maintain his position with the parent company, and be located in Cleveland.

Two personnel changes, part of the expansion program, have been announced at W. S. Tyler, Cleveland, Ohio.

WALTER J. PARKS, who has been with Tyler for over 25 years, will assume the new post of director of product development. He has served as chief engineer of the Screening Machinery Division. In his new post Mr. Parks will devote full time to design improvement of existing products as well as the development of new products in the screening field.

W. J. Parks

E. E. Gardner

EDGAR E. GARDNER succeeds Mr. Parks as chief engineer of the Screening Machinery Division. He steps up from the post of assistant chief engineer of this division, which he has held for the last nine years.

A number of changes have been made in the sales department of Caterpillar Tractor Company, Peoria, Ill.

E. C. CHAPMAN has been appointed assistant manager of the sales development department.

The northwest and southwest sales divisions of the company are being merged into a new western division, managed by J. A. JUSTESON.

W. E. MCCOY, manager of the southwest division, succeeds Mr. Chapman as manager of the eastern division.

Talcott, Inc., Providence, R. I., manufacturer of Talcott Belt Fasteners, has been purchased by Peerless Hardware Manufacturing Co., Lancaster, Pa. Until recently, Peerless was the Hardware Division of Pennsylvania Malleable Iron Corp., also of Lancaster, Pa. For 30 years Pennsylvania Malleable has supplied castings to Talcott and ac-

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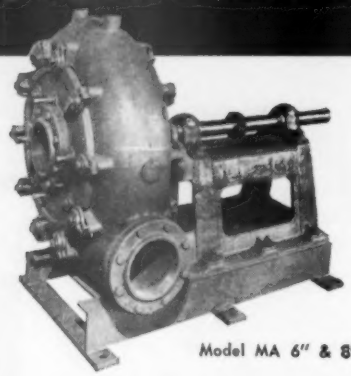
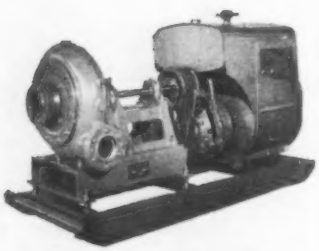
Lightning SAND AND GRAVEL PUMPS



Model MA 6" & 8"

Compact Design... Rugged Construction

LIGHTNING Model MA handles large quantities of sand and gravel economically, up to a total head of 100'. Simple design makes it easy to maintain close internal clearances. Rugged construction withstands the shock of large solids passing through. Large, clean passages insure maximum and continuous delivery.



Available Mounted on Skid Base Complete with Gasoline Engine

Close coupled with V-belt drive. Either pump or industrial gasoline engine may be removed from the structural steel base for separate use. Model MA pump is light in weight and compact, for easy handling.

"Sixty years of service to the sand and gravel industry." We offer a complete line of pumps including rubber-lined and new ceramic-lined models. Write for complete information.

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801 Woodswether Road • Kansas City 5, Missouri

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Specify Anaconda all Butyl Shovel Cable

This new shovel cable—the toughest in the industry—cuts shovel downtime. Months of torture testing throughout the country have proved it.

It endured the rugged cold of the Mesabi and the punishing heat of Florida's phosphate mines.

It was twisted, kinked, soaked, crushed and run over.

Its new Butyl *jacket* is the reason for this extra durability in the face of the effects of ozone and moisture and extreme physical punishment.

It is especially compounded to combine flexibility at low temperatures with thermal stability at high temperatures.

Here are other construction features which contribute to this cable's unequalled service record:

1. Anaconda's rubber-core grounding conductors offer a cushioning effect which minimizes pinching and wire breaking and offers greater ground contact protection.
2. Special shielding—a combination of copper cross-braided with cotton—eliminates chafing (and makes splicing faster and easier too).
3. Insulation is a special high-grade Butyl that withstands ozone, heat, and moisture.

Check all the features of this job-proved new shovel cable—they add up to extra cable life, less downtime, and dollar savings. Contact Department EFL-1-PQ, Anaconda Wire and Cable Company, 25 Broadway, New York 4, N. Y.

61255

ASK THE MAN FROM

ANACONDA®

ABOUT ALL-BUTYL SHOVEL CABLE

TRIAL SAMPLES
Of World-Famous WHITMORE'S Lubricants

OPEN CHAIN LUBRICANT INCREASES CHAIN LIFE UP TO 300%

Penetrates, lubricates, prevents rust. Lubricates deep into chain linkage to reduce friction on pins, rollers, bushings, pressure surfaces. Corrosion inhibitor prevents rust in vital working mechanisms. Lubricates close-tolerance internal surfaces to increase chain life up to 300%. Highly recommended for all climatic conditions to stop rust and corrosion even in salt atmospheres.

Packaged in handy 16 oz. aerosol spray-on containers or in bulk—send for a free trial sample.

ANTI-FRICTION COMPOSITIONS HAVE NO MELTING OR DROPPING POINT

Packaged in 14½ oz. cartridges for handy application with lever-type cartridge guns for constant protection to roller, ball, sleeve bearings and sliding surfaces in "hot" bearing applications or in areas with high ambient heat. Exclusive formulas have no melting or dropping point; moisture resistant; will not wash out; exceptional metal adherence properties; temperature reducing qualities; high extreme pressure values. Available in two grades. Whitmore's Anti-Friction Composition No. 1 (light density), recommended for high speed, high temperature applications. Anti-Friction Composition No. 2 (heavy density), for low-speed high-temperature applications or loosely-fitted bearings. Specify No. when requesting free trial sample.

68 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Open and Enclosed Chain
- Speed Reducers
- Enclosed Gear Cases
- Roller, Ball and Sleeve Bearings
- Wire Rope and Cable
- Hydraulic Units, Torque Converters

Est. 1893
THE WHITMORE MANUFACTURING CO.
LUBRICATING ENGINEERS
CLEVELAND 4, OHIO • VULCAN 3-7272

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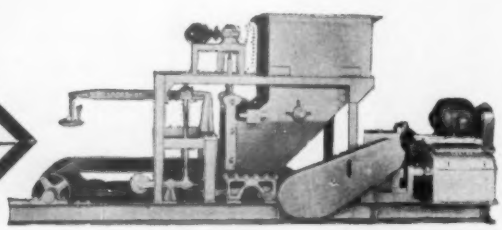
Schaffer Poidometer NOW—



1600 SCHAFFER POIDOMETERS ARE GIVING A GOOD ACCOUNTING OF THEIR PERFORMANCES

Schaffer Poidometers give automatic performance in WEIGHING, BLENDING, FEEDING, MIXING, RECORDING and PROPORTIONING of all BULK MATERIALS. Poidometers are dependable and eliminate production line snags. They give you complete assurance against costly errors.

Schaffer Poidometers are available with remote control devices for showing and changing feed rate and total weight recorders.

Write for ***FREE*** *catalog No. 5*

SCHAFFER POIDOMETER CO.
2828 Smallman Street **Pittsburgh 22, Pa.**

Enter 242-B on card, page 217

cording to Peerless, this arrangement will continue.

JOHN W. CHASE, formerly vice-president and treasurer of Talcott, Inc., has been appointed sales representative in charge of the Talcott line.

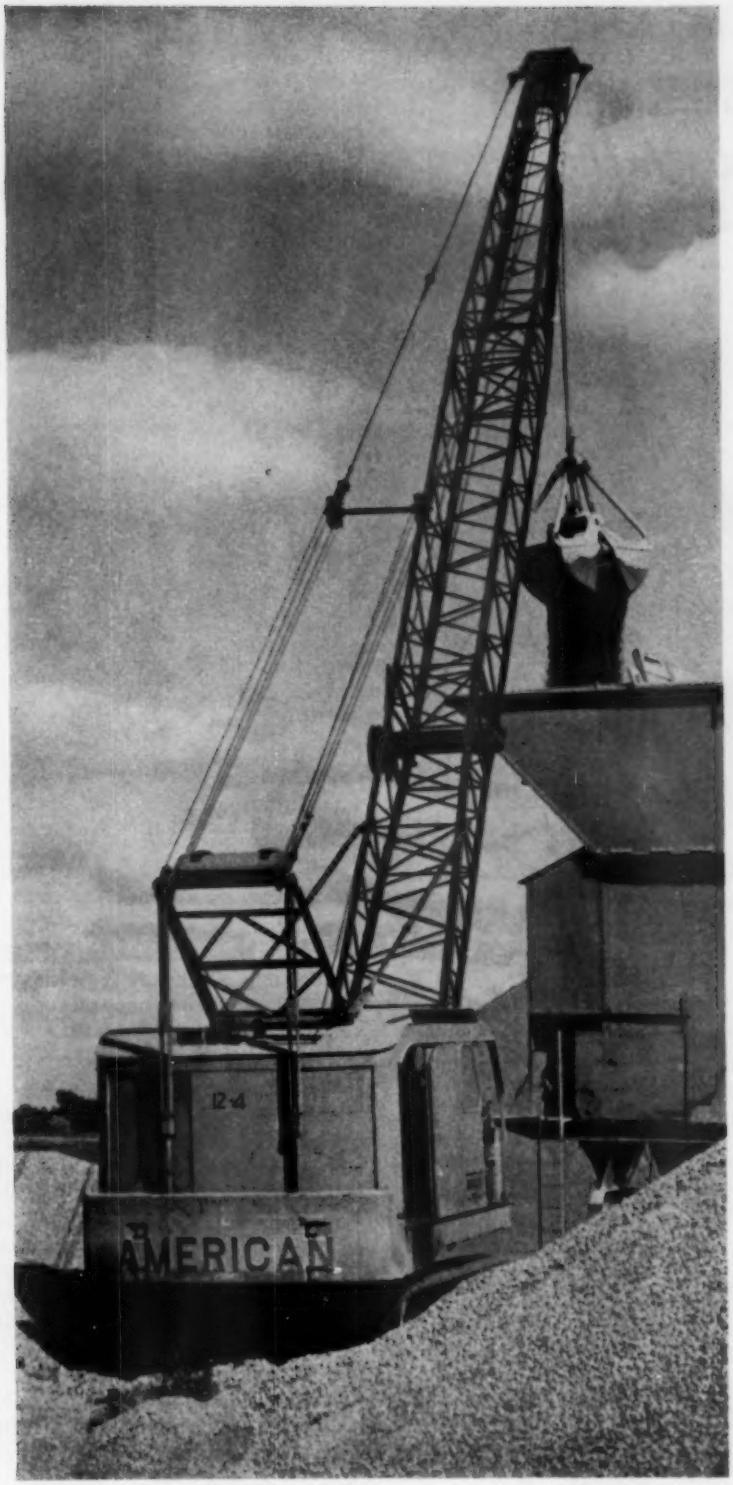
G. Morrison

GEORGE MORRISON has been appointed sales representative in Houston for the Amsco Division of American Brake Shoe Company, Chicago, Ill. Mr. Morrison will be primarily involved in setting up distributors for the Amsco line of hardfacing products. He will cover Texas, New Mexico, Oklahoma, Louisiana, and Arkansas.

HUBERT A. BERNET JR. has been appointed sales manager, engineering, for Webster Manufacturing, Inc., Tiffin, Ohio. For the last five years, Mr. Bernet has been assistant district manager at Cincinnati. His appointment is part of an over-all move to intensify and expand the company's sales activity in the bulk materials handling field.

CORNELIUS WHETSTONE has been named general industrial planning manager, North American operations, Massey-Ferguson. In the new assignment, Mr. Whetstone will continue to headquarter at Toronto, Ont., Canada, where he has been serving as industrial co-ordinator, marketing department, North American Operations. He joined the company in 1959 as general marketing manager, industrial division.

DR. JAMES E. PARKS has been appointed director of marketing research and manpower development for Westinghouse Air Brake Company. Most recently he had been associate professor of industrial man-



look for these long-range values in your next crane/excavator

You've heard it said that all makes of cranes and excavators perform pretty much alike. In some respects this may be true . . . if you're talking about new machines. But after a few hard years on the stockpile — or loading in the pit — the *real* differences begin to show up! And here's where AMERICAN's modern engineering and rugged construction pay off. Examples . . .

On your AMERICAN, you have antifriction bearings at *all* vital points, right on down to the brake linkages. That's one reason for AMERICAN's fast response — year after year — without need for frequent take-up or rebushing. Free-rolling load and hook rollers are tapered to eliminate scuffing action that causes wear and requires adjustment.

AMERICAN's heavy-duty clutches engage smoothly without grip or fade, give you plenty of cool-running contact area for continuous duty-cycle operations. These clutches are easy to adjust.

Rugged machinery deck is all-welded and jig-bored . . . for perfect shaft alignment from the first day on. Travel machinery is the huskiest in the industry.

It's details like these — and many more like them — that enable AMERICAN to cut your pit costs over the long pull. Talk it over with your AMERICAN distributor . . . today. CC-737

SHOVELS ½ TO 4½ YDS
CLAMSHELLS—DRAGLINES

FORGED FITTINGS FOR WIRE ROPE AND CHAIN
(Crosby-Laughlin Division)

AMERICAN

AMERICAN HOIST and DERRICK COMPANY
ST. PAUL 7, MINNESOTA

no more downtime to replace connectors...

HANCO FLUX POWER SCREEN HEATERS

transmit power through the air!

With the all new Flux Power by Hanco all mechanical connections between transformer and screen are eliminated. The 0 to 4000 ampere current is transmitted through the air by inserting a conductor through the eye of the transformer. This permits unrestricted vibration, maximum power transmission and true screen balance.

5 YEAR GUARANTEE

★ Dust-tight, waterproof construction
★ Dual voltage, 220/440 volt
★ Use either plain or stainless cloth
★ Anti-magnetic steel side rails

write today for full details:

HANCO INTERNATIONAL

CANTON 7, OHIO, U. S. A. — CABLE HANCO

EUROPEAN SALES AND MFG.
HANCO INTERNATIONAL
6 WIBAUTSTRAAT • AMSTERDAM, HOLLAND

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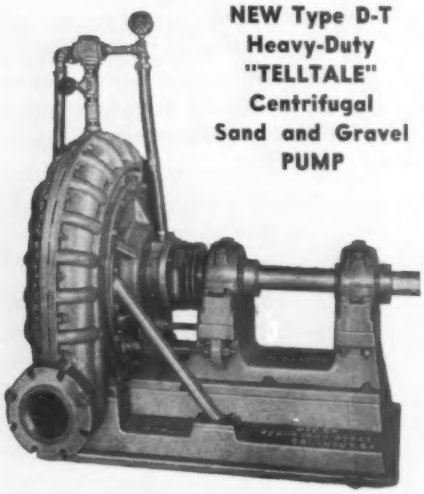
ONLY "TELLTALE" PUMPS WARN WHEN IT'S TIME TO RELINE



NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

No time-wasting look-see at the pump's insides necessary. Water leaking through the ports between the bolted halves of the outer shell tell the tale of a shell liner worn through.

When the shell liner wears through, sand and gravel quickly eat through the rope-type packing between shell liner and the shell. Hence the telltale leak.

AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION

The useful and exclusive telltale feature is one of all the best retained in the latest "Telltale" pump, only type we now manufacture.

Some new features: New highs in production — new lows in downtime, because of simple foolproof assembly for changing parts—also "Telltale's" own.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

PEKOR IRON WORKS, INC.

ESTABLISHED 1892

LOCK DRAWER 909 FAIRFAX 2-4020 COLUMBUS, GEORGIA

Enter 244-B on card, page 217

agement at Purdue University. He has previously held assistant professorships in the School of Commerce and Business Administration at the University of Mississippi and at the Harvard Graduate School of Business Administration.

M. E. STANTON, of the Mobile Hydraulics Division, has been promoted to central region sales manager for Vickers Incorporated, Division of Sperry Rand Corporation. He will be responsible for all mobile sales activities in the Chicago, Minneapolis, Tulsa, and Houston territories.

M. E. Stanton

Mr. Stanton originally joined Vickers as a co-operative engineering student attending the Illinois Institute of Technology. After military service and further training Mr. Stanton rejoined Vickers in 1956.

Promotions at the executive staff level of the Axle division of Eaton Manufacturing Company Cleveland, Ohio, were announced recently.

CHESTER D. CHRISTIE, formerly sales manager of axles, has been appointed assistant general manager. He succeeds QUENTIN N. GROTH who is currently on special assignment in Argentina for the company.

WILLIAM S. HAMMEL, formerly director of European sales, was named sales manager of the division.

JOHN ADAMS THIERRY was elected February 28 to the board of directors of Bucyrus-Erie Co., South Milwaukee, Wis. The company also announced the appointment of MERLIN H. BIRK as vice-president.

Mr. Thierry, a Bucyrus-Erie vice-president, has served as secretary of the corporation since April, 1958, and general attorney sinee September, 1957. He joined the legal de-

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TL-12 4-wheel drive 4,000-lb carry capacity

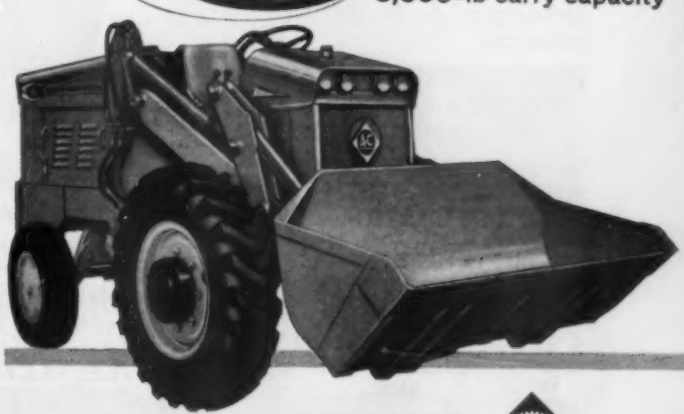
BOOST OUTPUT ON MATERIAL HANDLING JOBS

. . . put an Allis-Chalmers TL-10 or TL-12 to work loading trucks . . . digging foundations . . . charging bins . . . working at the stockpile. Both units offer big loader advantages that bring extra loader output.

The TL-10 and TL-12 give you high 8-ft. 4-in. dumping height and long 32½" of *effective* reach to help keep *more* big trucks loaded and on the move. Both tractor loaders feature Allis-Chalmers low-cost power-reversing Tractomatic transmission. This easy-operating transmission automatically gives you a higher speed when shifting to reverse. The operator selects the best operating gear and then just flips a lever on the steering column to go forward or reverse. Since reverse speeds are 30% faster than forward, you get extra backaway speed without shifting into a higher gear. Result: faster cycles . . . easier operation . . . increased production.

Let your Allis-Chalmers dealer demonstrate the 4,000-lb carry capacity TL-12 or the 3,600-lb carry capacity TL-10, or any of the other four tractor loader models—ranging in power from 83 to 184 hp—in carry capacity from 5,300 lb to 10,500 lb. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisc.

TL 10 2-wheel drive
3,600-lb carry capacity

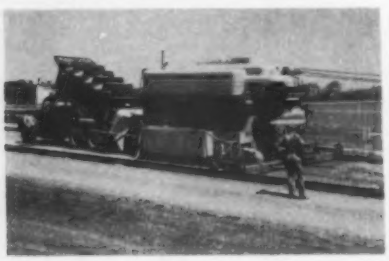


move ahead with ALLIS-CHALMERS

. . . power for a growing world

Another Example of Reduced Maintenance Costs
(Performance Study #387)

Until three years ago, Barton Contracting Co., Osseo, Minn., contractor on the Minneapolis-St. Paul Freeway System, had used ordinary grease and oils in their fleet of 80 tandem trucks, asphalt plants, and heavy equipment such as the Rex paver, shown below.



Then, an International 180 Tandem lost its rear-axle plug. With a dry box, noise and overheating, a costly repair job seemed certain. ALMASOL 608 (SAE 140) GEAR LUBRICANT was installed, with no further work on the assembly, *and it has run without maintenance and practically no make-up oil for the three years since!*

Similarly, serious gear overheating was occurring on Barton's Bucyrus-Erie shovels and cranes, subjected to very heavy operating conditions. ALMASOL 607-608 GEAR LUBRICANTS reduced frictional heat and the need for make-up oil to an absolute minimum!

HERE'S HOW YOU CAN CUT *YOUR* EQUIPMENT MAINTENANCE COSTS: send today for complete information on ALMASOL 607-608 GEAR LUBRICANTS.

WRITE, WIRE OR PHONE DEPT. PQ-5

LUBRICATION ENGINEERS INC.
Fort Worth 11, Texas
Custom Built Lubricants for Heavy Equipment

LE-61-3

Enter 246-A on card, page 217

partment of the company in 1940.

Mr. Birk has been Bucyrus-Erie controller since joining the manufacturer in 1959. Prior to that he was assistant to the president of Illinois Tool Works, Chicago, Ill.

The proposed merger of Atlas Powder Company, Wilmington, Del., and The Stuart Company, Pasadena, Calif., has been approved by the boards of directors of both firms. The merger, which now requires the approval of Atlas and Stuart shareowners, would involve a four-for-one split of the Atlas stock.

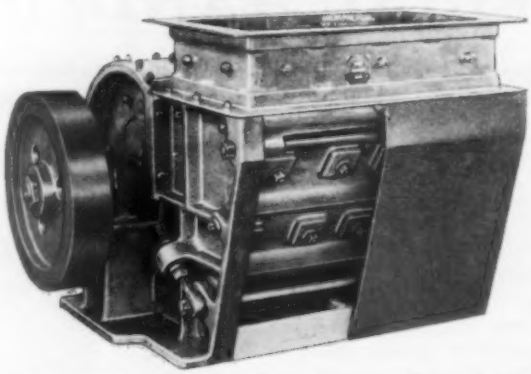
Announcement of the boards' approval was made jointly by RALPH K. GOTTSHALL, Atlas president, and ARTHUR HANISCH, president of Stuart. Atlas shareowners will vote on the proposed merger at the company's annual meeting in Wilmington on April 25, and Stuart shareowners at a special meeting on the same date at the company's offices in Pasadena.

Atlas manufactures industrial chemicals and explosives and sells them in both domestic and international markets; The Stuart Company manufactures ethical pharmaceuticals, which it distributes throughout the United States. Under the proposed merger, Stuart would operate as The Stuart Division of Atlas.

DOUGLAS E. NEWTON has been appointed to head the newly created aggregate - conveyor department for Wemco, a division of Western Machinery Company. He will be responsible for the sales and development of Wemco's aggregate preparation, benefication and conveying line. In addition he will manage the operation of the engineering group responsible for designing and engineering of complete aggregate processing plants.

D. E. Newton

American's 30 SERIES HAMMERMILL



for high volume reduction with minimum maintenance rely on hammermills backed by American's 50 years of experience.

Write for American's bulletin **BETTER STONE CRUSHING**

American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1059 MACKLIND AVE. ST. LOUIS 10, MO.

Enter 246-B on card, page 217

Diamond Iron Works division Goodman Manufacturing Company, Chicago, Ill., has appointed Moody Equipment and Supply Company, Little Rock, Ark., as distributor for the complete line of Diamond products in Arkansas.

ERWIN A. WENDELL has been appointed manager of advertising and public relations for Link-Belt Company, with headquarters at the company's executive offices in Chicago, Ill. The appointment follows the retirement of BERTRAM V. JONES, advertising manager for the past ten years and a member of the advertising department since 1923.

E. A. Wendell

Mr. Wendell joined the company's engineering department at the Pershing Road plant in Chicago in 1917, and entered the sales department in 1921. He joined the executive sales division at the executive offices in 1953, engaging in market research and sales analysis. He was named assistant advertising manager in August.

FRANK T. HOUSE, formerly sales promotion manager for Bucyrus-Erie Co., South Milwaukee, Wis., has been appointed sales services manager. In the newly created position, he is charge of field service, parts sales, dragline bucket sales, sales promotion, and claims. Mr. House joined the heavy machinery manufacturer in 1955 as a small machine sales representative at the firm's Atlanta, Ga., regional sales office.

JORGE A. ROSSI has been appointed export sales manager for the international division of Bucyrus Erie Co. Mr. Rossi joined the power crane, shovel, and drill manufacturer's International Division in 1946. He was export sales manager, commercial cranes and excavators, prior to his recent appointment.

ROBERT T. CRAIG, former export sales manager, remains as director

make it last – make it LESCHEN

The man who uses wire rope knows that Leschen quality and service give best results—that Leschen Wire Rope keeps production on the move—that Leschen will make sure it's the right rope for his need. ▪ To be *safe* and *sure* call your Leschen distributor for expert advice on your wire rope needs. For further details and literature, write Leschen Wire Rope Division, 2727 Hamilton Avenue, St. Louis 12, Mo.

PORTER

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY INC.

Porter serves industry with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

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HAYWARD CLAMSHELL BUCKETS

**WORK LONGER,
WORK FASTER,
WEAR LESS!**

Designed with rugged, one-piece alloy shells... wide type, cast manganese steel cutting edges... smooth shell interior for fast, capacity loads and easy discharge... manganese bushings... diagonal truss brace to keep shell in line... has no side sway or back lash... *plus many other cost-cutting design features!*

Get complete details. Write today for illustrated bulletin.

THE HAYWARD COMPANY

50 CHURCH STREET, DEP'T P, NEW YORK 7, N. Y.

Builders of Better Buckets Since 1888

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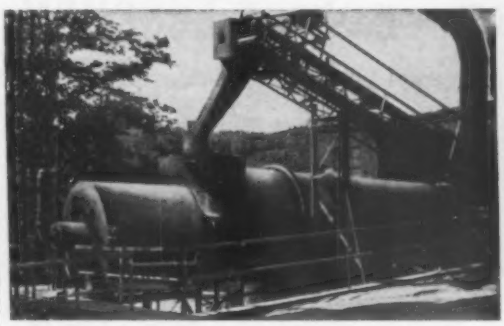
KILNS • COOLERS • DRYERS

researched, designed, and built specifically for your needs and product . . . by experienced McDermott engineers



This McDermott Rotary Dryer installation fulfilled specific requirements of the North American Refractories Little Gap plant. Economical dependable performance results from McDermott's sound engineering practices and long experience.

Staggered cup-shaped lifters assure even distribution of product. RESULT: greatly increased capacity and efficiency.

Write for brochure, estimates, or recommendations . . . no obligation.

McDermott
BROS. CO., INC.

ALLENTOWN, PENNSYLVANIA — HE 3-3231

Enter 248-B on card, page 217

of the company's International Division and a consultant on sales matters and related activities.

add

WILLIAM C. PIETSCH has been appointed product engineer in the quarry and mining machine section of the large machine division of Bucyrus-Erie. Mr. Pietsch was formerly a product engineer in the commercial crane and excavator division.

Kraft Bag Corporation, following a merger January 31, 1961, is now known as the Kraft Bag Division of St. Marys Kraft Corporation, subsidiary of Gilman Paper Company.

TOM L. JONES, formerly special representative for Kraft Bag Corporation has been appointed sales manager in charge of multiwall bag sales for Gilman Paper Company, with headquarters at New York, N. Y.

JOSEPH ALBIEZ has been appointed sales manager for Flygt Corporation, Hoosick Falls, N.Y., according to an announcement from S. L. ALBERTSSON, president.

Joseph Albiez

Mr. Albiez comes to Flygt from Curtiss-Wright Corporation where he was general sales manager of the South Bend Division.

Four new assignments have been announced at Crown Zellerbach Corporation, San Francisco, Calif.

ROBERT F. GILL has been named sales manager for the Multiwall Bag Sales Division, Crown Zellerbach Corporation, with headquarters at San Francisco. This is a newly created position within the Division. Mr. Gill is a nine-year veteran with Crown Zellerbach. His most recent position was national accounts manager for the Multiwall Bag Sales Division.

FRED H. BOSTOCK was named

YOU GET FAST, SMOOTH HARDFACING WHEN YOU USE VICTOR ROD

There's a right Victor rod for each of your hardfacing jobs . . . and the accompanying chart helps you select the proper one to use in rebuilding worn parts on earthmoving equipment, crushers, dredges, etc. You'll find Victor rod easy and fast to use, thus saving labor and time on machines tied up for repair. Order a supply from your Victor dealer today.

FREE. Blow-up of this chart (size 14"x20") suitable for wall mounting, yours for asking; also copy of "Practical Guide to Hardfacing."

Write today.

RODS FOR MANUAL APPLICATION

Equipment or use	These conditions	Use this Rod	Application
Crusher rolls, jaws, hammers, liners, mantles	Severe abrasion & impact	VICTOR Crusher Rod	AC-DC Elec. only
Earthmoving, drilling tools, rippers, augers, ditchers, excavators, loaders	Severest abrasion	VICTORTUBE (Tungsten Carbide)	Gas AC-DC Arc
Earthmoving tools, brick augers, conveyors, mill guides	High abrasion; sliding friction	VICTORITE	Gas AC-DC Arc
Crushers, grinders, mixers, scrapers, fan and screw conveyors	Abrasion and impact	TUBE VICTORITE	Gas AC-DC Arc
Cement pumps, brick dies, dry bearings & journals, expellers	Heat; abrasion, corrosion	VICTORITE 1	Gas AC-DC Arc
Crusher & dredge parts, bucket teeth. A tough low-cost hardfacing	Severe impact; abrasion	VICTORALLOY	Gas AC-DC Arc
Crushers, bucket lips & teeth, muller tires, dozer blades, dredge pumps	High abrasion; medium impact	VICTORALLOY #1	Gas AC-DC Arc
Clutch parts, gears, latches, pins & keepers; build-up for hardfacing	Angular shock; extreme impact	VICTORALLOY "A"	AC-DC Arc only
Tractor idlers, sprockets, rolls, crusher parts, pump casings, impellers, liners	Heavy impact; moderate abrasion	VICTORALLOY "B"	AC-DC Arc only
Cement screws, gudgeons, drag chains, pressure rolls, mixer blades & paddles	High abrasion; moderate impact	VICTORALLOY "C"	AC-DC Arc only
Drill tools, crawler pads, crushers, mine rails; build-up for hardfacing	Severe impact; compression	VICTOR Multi-pass (for Build-up)	AC-DC Arc only
Hardmetal underbase for manganese steel parts on crushers, dredges, dippers	Severe impact; compression	VICTOR Ni-Mn (for Build-up)	AC-DC Arc only
Low-cost "stainless" joining rod for crushers, dippers, crawlers, dredges	Severe impact	VICTOR Ni-Mn (for attachment)	AC-DC Arc only

WIRES FOR AUTOMATIC & SEMI-AUTOMATIC APPLICATION

Equipment or use	These conditions	Use this Wire
Crushers of all types, tool joints, mullers	Severe abrasion; moderate impact	VA 0
Scrapers, bucket teeth crushers	Abrasion & compression with impact	VA 1X
Dredge rolls, cable sheaves	Severe compression & impact with abrasion	VA 2X
Mill guides, crushers, grinders	Severe abrasion & compression with impact	VA 3
Build-up on trunnions, tractor idlers & tracks	Severe impact & compression	VA 4X
Shovel rollers, tractor rollers & idlers	Severe metal-to-metal impact & abrasion	VA 5X
Build-up on mine car wheels & tractor rollers	Severe impact & compression with abrasion	VA 7X
Dozer blades, scraper blades, tool joints	Earthworking abrasion & impact	VA 8X
Tool joints, crushers, scrapers, swing hammers	Extremely severe abrasion; moderate impact	VA 10
Tool joints, scraper blades, augers	Maximum abrasion; earth cutting, scraping	VT 60 (Tungsten Carbide)
Build-up manganese steel parts for overlay or to size	Wear, all types manganese steels	Ni-Mn (Hadfield)

VICTOR for hardfacing

Profitable dealerships open; inquire now!

VICTOR EQUIPMENT COMPANY

Alloy Rod & Metal Division

13808 E. Imperial Highway, Norwalk, California
. . . Wakita, Oklahoma

H-76

machinery sales manager. Mr. Bostock has had more than 30 years paper sales and management experience with Crown Zellerbach.

ROBERT W. MINAHEN was appointed the division's western regional sales manager. In his new assignment Mr. Minahen will direct divisional salesmen in 11 western states. A graduate of the University of California, Mr. Minahen participated on the university's Rose Bowl football teams in 1949, 1950, and 1951. Except for military service Mr. Minahen has been in sales work with the Multiwall Division since 1951.

DONN E. NISSEN was named San Francisco district sales manager. He will supervise divisional sales activity in Nevada and California.

Mr. Nissen joined Crown Zellerbach in 1950 as a salesman.

JULIUS G. KERN JR. has joined The Eimco Corporation, Salt Lake City, Utah, as New York district manager for Tractor-Loader Sales.

Mr. Kern has a background of ten years experience in the tractor-loader field, in such capacities as trainee instructor, sales representative, district manager, and as assistant and industrial sales manager for both manufacturers and distributors of crawler equipment.

E. W. MAAS, president and general manager of Kwik-Mix Co., Port Washington, Wis., died March 17 following a a heart attack. He was 62.

E. W. Maas

Mr. Maas had been president of Kwik-Mix, a division of Koehring Company, since 1948, when he was transferred from the Koehring Division, Milwaukee. He was associated with Koehring for 44 years, joining the company in 1917 as head of its cost department. He held several production posts, progressing to shop superintendent in 1940 and works manager in 1946.

HARRY S. JESKE, manager of the Koehring southern plant at Chattanooga, Tenn. has been appointed general manager of Koehring's Kwik-Mix Division, Pt. Washington, Wis.

H. S. Jeske

With Koehring for 20 years, Mr. Jeske was works manager at Kwik-Mix from 1949 to 1952, when he was transferred to Chattanooga as works manager there, later becoming plant manager. He joined the company in 1941 as an inspector in its Koehring Division, Milwaukee.

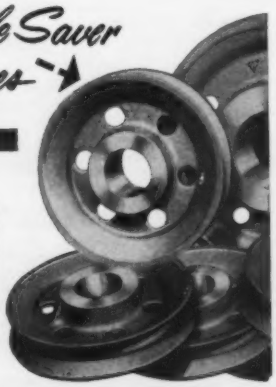
F. V. DEADERICK, vice-president and director of personnel, and a member of the board of directors of Bemis Bro. Bag Company, St. Louis, Mo., retired in January. Mr. Deaderick is succeeded by E. F. MUEHLHAUSEN, a staff assistant in the personnel department headquarters.

"FOUNDRYMEN FOR OVER FIFTY YEARS"

FARRELL-CHEEK
SHEAVES and Wire Rope Fittings

Cast Steel and over 50 years of know-how in using it account for the superiority of Farrell-Cheek sheaves and wire rope fittings. Actual service in the field readily confirms all claims.

Cable Saver Grooves



IMPROVED WEDGE TYPE SOCKET

SNATCH BLOCK SOCKET

STANDARD TYPE SOCKET

Sheaves with Cable Saver Grooves and unmatched resistance to fatigue and wear ★ Choker Hooks of great strength and utility ★ Standard, Wedge Type and Snatch Block Sockets of many performance features ★ Clips, Thimbles and Eye Hooks . . . all electric furnace cast from Farrell-Cheek carbon and F85 alloy steels.

You'll find the entire line in CATALOG 22, complete with specifications. WRITE TODAY.

F85 FC

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THOMASVILLE DRILLING & TESTING CO.
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This position will offer the right man an opportunity to join one of the most progressive, well established companies in the industry and will provide an excellent salary, profit sharing and bonus.

Send a resume with complete information including present salary to

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27"x24" Komarek Greaves Briquet Presses
6'x25'; 6'x50' Louisville Rotary Dryers
8'8"x70' Ruggles Cole Dryer
8'x11' Traylor Ball Mill, Steel Lined
7'x24' Allis Chalmers Tube Mill
#5060 Dixie Mogul Hammermill
SX13 Penna Hammermills, 400 HP
Heil Patterson Crusher, 100 HP
Raymond #50 & #40 Impact Mills
36"x42" Koppers 2 Roll Crushers
36"x48"; 20"x6" Jaw Crushers
20"x40"; 30"x96"; 40"x84" Screens
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Bucket Elevators 45' to 90' Centers
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Also one (1) used Travel Drill.

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DIESEL LOCO CRANE
25-ton Industrial Brownhoist with D13000 Cat. diesel & 60 ft. boom

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3' x 30', 6' x 60', 7' x 120', 9' x 160'

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48" & 20" Traylor with motors
12", 16", 20", 36" Allis Chalmers
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CEMENT PLANTS
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150'—8" Fuller Huron Airslide with Spencer Blower.

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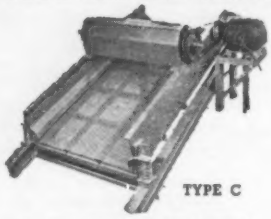

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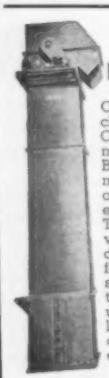

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2½ cu. yd. Bucket
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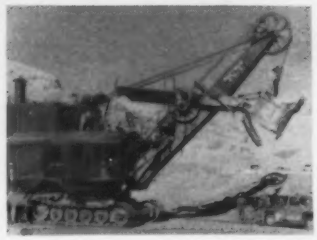

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8' x 56' kiln, ½" welded
7'6" x 62' kiln, ½" welded
7' x 60' Bonnet dryer, ⅝"
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6' x 52' Bonnet dryer, 5/16"
6' x 50' Louisvile steam-tube
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1—Hardinge 6' x 36" conical ball mill, 75 HP drive, classifiers, etc.
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1—Allis-Chalmers 5' x 5' ball mill, 75 HP.
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Dixie #5060 hammermill, 500 HP
Amer. #38-S rolling ring crusher
Wms. 36 x 24 hammermill, 50 HP
Robinson #C330 hammermill, 60 HP

MISC.

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Elevators, 95' high, steel buckets, steel chain, casing, 7½ HP drive
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150	G.E. B.B. Open	KT-557	1200
150	Cont. T.E.F.C.B.B.	NF-743X	900
150	Al Chal. B.B. Open	AR-826	900
125	Reliance B.B. Open	AA-504	3600
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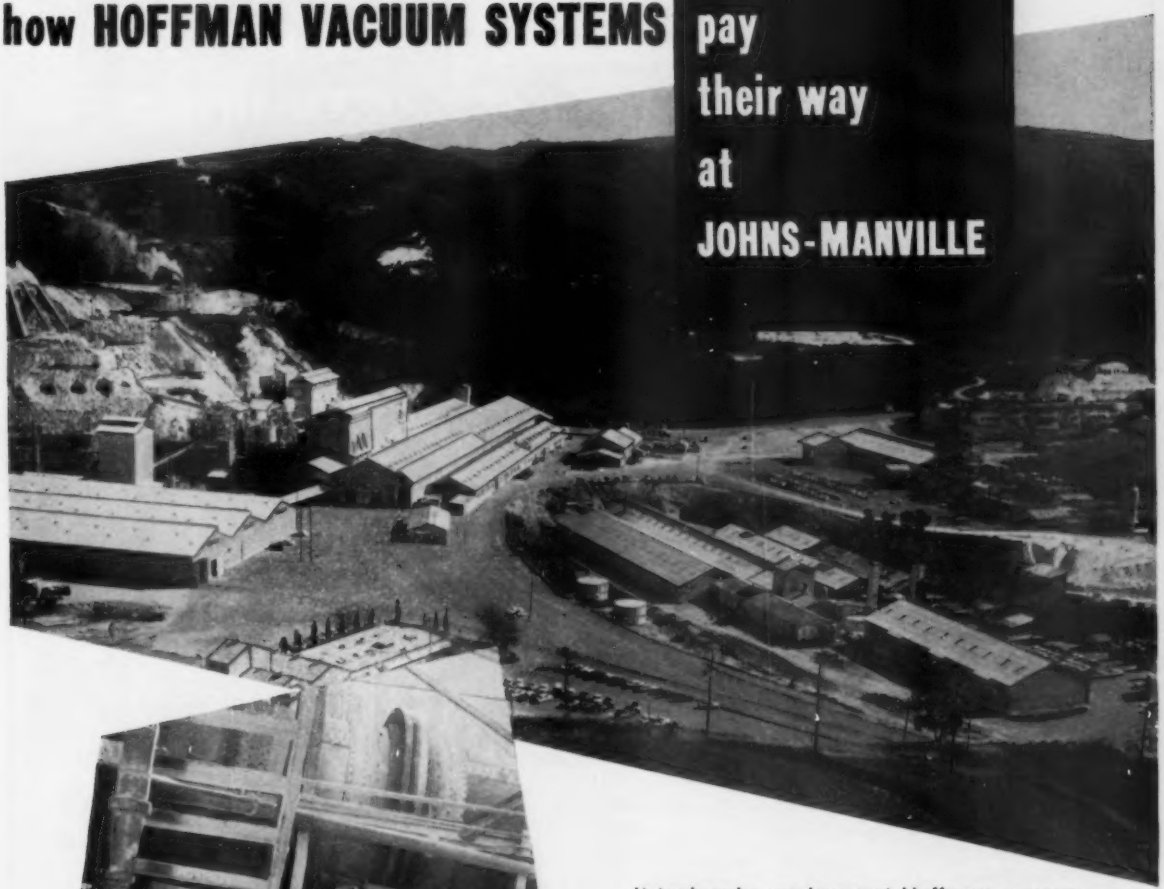
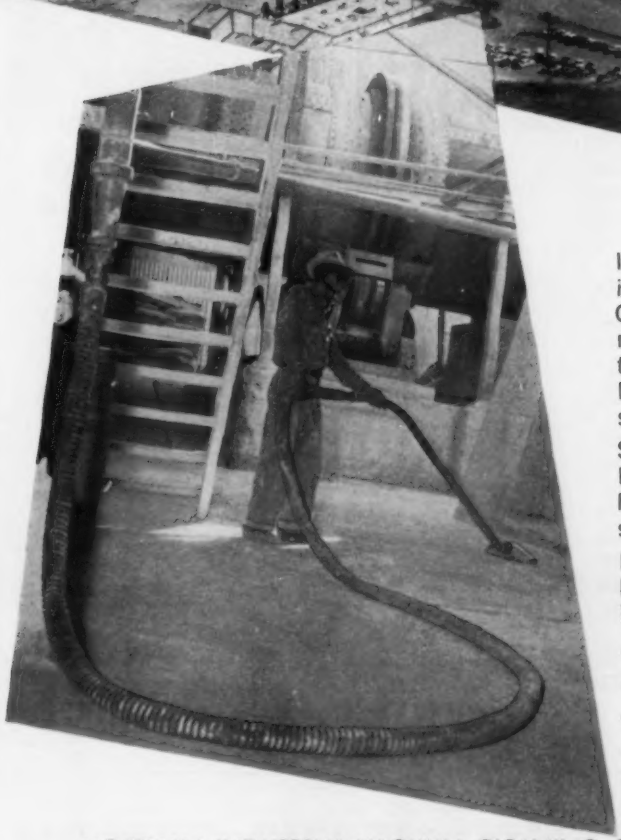
how HOFFMAN VACUUM SYSTEMS pay their way at JOHNS-MANVILLE





It took only one low-cost Hoffman vacuum installation in the Johns-Manville, Lompoc, California plant to prove that the unit would materially improve their housekeeping and more than pay its way by making substantial labor and material savings. Plant efficiency showed improvement.

Since 1946, following the purchase of their first Hoffman portable vacuum system, Johns-Manville has added six additional 40 hp stationary systems as facilities have been expanded.

If you have a dust problem of any kind, ask a Hoffman representative to show you how industrial vacuum systems can:

- **Improve working conditions**
- **Reduce plant maintenance costs**
- **Reclaim valuable materials**
- **Provide better housekeeping**
- **Lower labor costs**

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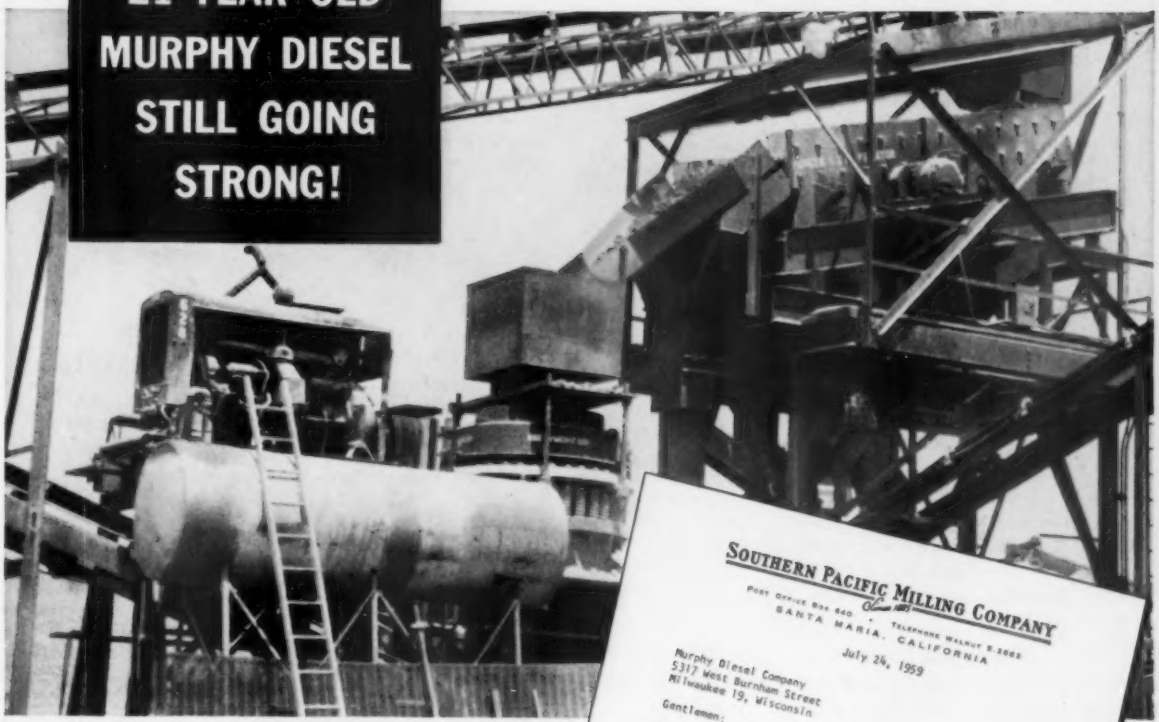
21 YEAR OLD MURPHY DIESEL STILL GOING STRONG!



SOUTHERN PACIFIC MILLING COMPANY

POST OFFICE BOX 660 — TELEPHONE WALNUT 8-2602
SANTA MARIA, CALIFORNIA

July 24, 1959

Murphy Diesel Company
5317 West Burnham Street
Milwaukee 19, Wisconsin

Gentlemen:

We believe that with one of the earliest Murphy engines built, we have discovered the ultimate in diesel engine economy and dependability.

A year and a half ago, in assembling equipment to supply rock to various contractors helping to build the new missile base near Lompoc, Calif., we were in need of 150 horsepower for a new four-foot standard head Symons cone crusher. After checking an old MDX which we'd had on hand for a number of years, we decided to use this engine, concluding that we might get a month or two of use from it; actually, we were planning purchase of a new Murphy Diesel engine.

This old MDX engine is still running -- we have had no service difficulties of any consequence -- the fuel economy has been nearly unbelievable in comparison to normal standards. I personally have long been a believer in Murphy Diesel economy, dependability, and quality, but this experience with the engine is the finest I have ever seen.

Very truly yours,

SOUTHERN PACIFIC MILLING COMPANY

Robert O. Littlejohn

Robert O. Littlejohn
Northern Division Manager

ROL:lm

Proof that Murphy Diesel saves you money

This early model Murphy is still earning its way! According to the owner, it is operating efficiently with fuel economy that is "nearly unbelievable in comparison to normal standards." The experience of Southern Pacific Milling Company with this 21-year-old Murphy is the best evidence that operators who want "the ultimate in Diesel engine economy and dependability" are wise to choose Murphy.

Twenty-one years of improvement in diesel engine design and construction make today's Murphy Diesel first choice for always-dependable, low-cost operation.

MURPHY DIESEL

4168

HEAVY-DUTY POWER FOR CONSTRUCTION

Murphy Diesel engines and power units are available in sizes from 105 to 420 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 70 to 227 K.W.

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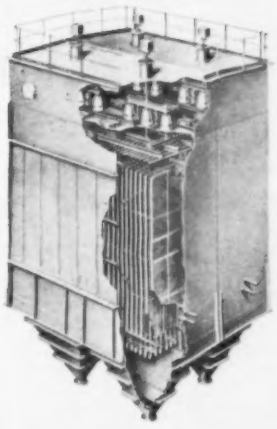
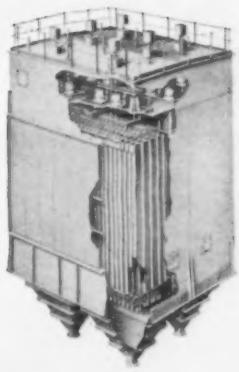
How Important Is Precipitator Size?

Traditional Design →





Modern Design ←

As shown in these two illustrations, Research-Cottrell's more compact modern design is appreciably smaller than the traditional design.

A common fallacy assumes a larger precipitator with lower gas velocity is preferable to a smaller precipitator with higher gas velocity.

This assumption overlooks important economies now obtained with:

(a) Efficient voltage application.

(b) Specific control of electrical sections.

(c) Electrode design improvements.

(d) Automatic Rapper Control.

(e) Accurate internal baffling.

(f) Proper control of gas flow, based on three-dimensional model studies.

Close familiarity with these techniques and improvements has made possible guarantees of 99 per cent collection on large, modern installations.

A. Applied Voltage

The relationship between voltage and size of the precipitator is approximately as shown in Figure 1.

Most efficient operation and minimum size are obtainable by insuring operation at maximum voltage under varying conditions of gas flow, particle size, resistivity, etc. Generally, the amount of arc-over in the precipitator will determine the practical operating voltage limit. By using the arc-over as the motivating control factor, through measurement and integration, maximum voltage can be insured at all times.

B. Sectional Voltage Control

Since gas conditions vary throughout any precipitator, higher efficiencies are obtainable if the precipitator is sectionalized with individual voltage control for each section.

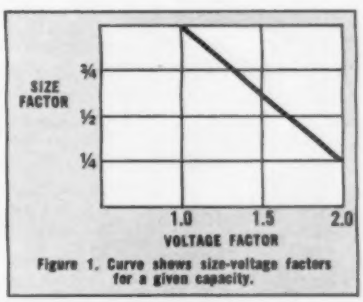


Figure 1. Curve shows size-voltage factors for a given capacity.

C. Electrode Design

Efficiency can be seriously affected by re-entrainment (that is the re-suspension of dust that has already been collected). Properly designed collecting electrodes, or plates, providing correct baffling to shield the collecting surface against the sweeping and scouring effects of the gas stream can reduce overall precipitator size 25–50 per cent.

D. Automatic Rapper Control

Rapping intensity must vary to meet the changing conditions of gas flow, particle size and resistivity. Otherwise, efficiency will decrease due to either too heavy a blow causing a re-entrainment, or too light a blow allowing dust build up on the electrodes necessitating operation at reduced voltages. Automatically controlled, fully adjustable rapping equipment insures optimum operation at all times.

E. Internal Baffling

Maximum efficiency can only be obtained by reducing the sneakage (part of gas stream which leaks or sneaks around the treatment zone) to an absolute minimum through the proper design and use of internal baffling proven by model studies and research on full-size precipitators.

F. Gas Flow—Model Studies

Proper gas flow patterns across the face of the precipitator can result in a 25–50 per cent reduction in over-all size. The use of transparent plastic three-dimensional model studies as well as field research has resulted in refinements in design never before possible.

Only at Research-Cottrell can you be assured of these latest of design techniques and improvements providing the most economical selection of equipment and efficiency of operation. Research-Cottrell personnel, backed by nearly a half century of gas cleaning experience, stand ready at any time to provide information or service.

For details or more information relative to the data contained herein, or any other general inquiries, please contact your nearest Research-Cottrell representative or write directly to:

Research-Cottrell, Inc.
Office and Plant: Bound Brook, N. J.
Representatives in Principal Cities of U.S. and Canada. RC223

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is like a full-time consultant

on your staff

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Autocar Custom-Engineered Tandems move the heaviest construction equipment.

Autocar "Michigan Special" hauls 47-ton payload, making the most of Michigan laws

Custom Builders to the Trucking World

Wherever hauling duties are rugged and steady . . . wherever maximum performance is crucial, back comes the message, "We need Autocars . . . nothing less."

So you find Autocar working on the toughest construction jobs all over the world, carrying maximum legal loads under the many varying state laws, doing the ruggedest off-the-highway/over-the-highway work.

Every Autocar is custom-engineered from "rubber to roof" for its specific job. Components are perfectly matched throughout its design and construction—always with an eye to quality. Frame rails, for example, are made of the finest steel . . . custom-drilled to avoid unnecessary holes and to assure perfect alignment of components.

For you, Autocar produces just the truck, at a reasonable cost, that will earn the most on your investment. Buy less if you can afford it—but where every dollar counts, buy the "World's Finest."

Autocar
"World's Finest"

Division of
THE WHITE MOTOR COMPANY
Exton, Pa.

When you want more than a 'Rock Shovel'

Digging rock has always been the standard test for shovel ruggedness. But just digging rock is not enough these days. Any lumbering, slowed down shovel can dig rock. It takes modern high speed production to dig rock at a cost on which a profit can be made.

Lorain shovels are designed on this basis. Take the 1¼-yard Lorain-56 for example. It's sturdy, it's fast and has exclusive features that enable it to pay off on today's profit squeezing operations.

Joy-stick Controls. Only 2 levers are needed to "feed" metered air-power to all turntable clutches for the easiest, smoothest, most co-ordinated operation. It's easier on the operator—easier on the machine—boosts production.

Shear-Ball® Turntable Mounting. The superstructure is held to the crawler and revolves freely and smoothly on a huge ball bearing of hardened steel balls sealed in precision ground and hardened steel races. The constant adjustment, maintenance and lubrication problems of roller type mountings are gone forever. Think how this eliminates down time, increases production. Shear-Ball is guaranteed for 10 years.

There are many more reasons why you should buy Lorains for rock digging. Why not see your Lorain distributor today for the full story.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

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DOES MORE FASTER • FOR LESS

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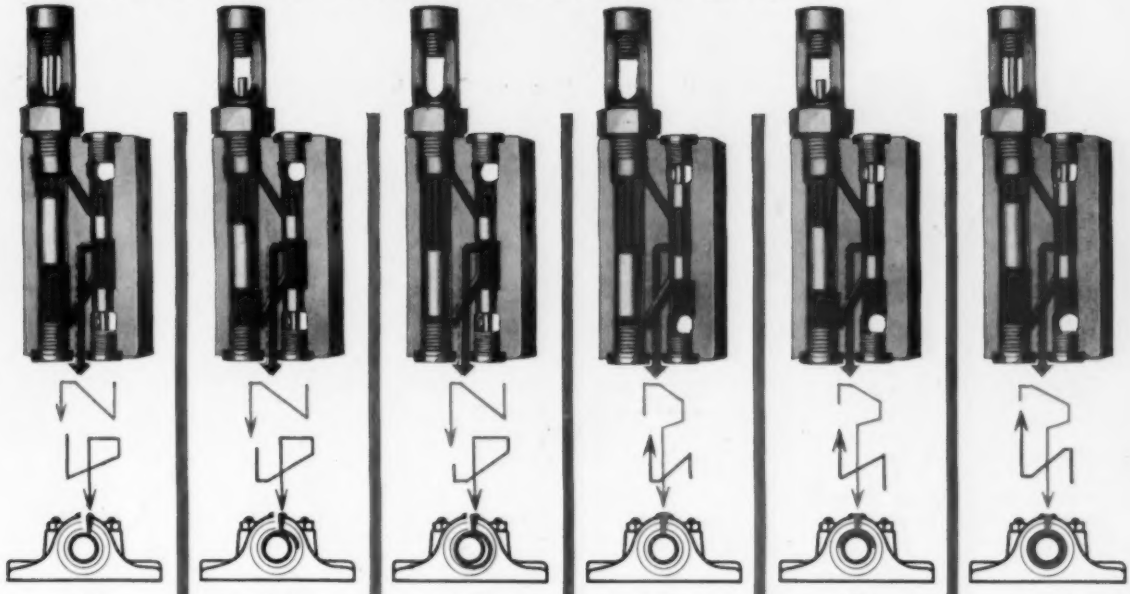
OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

Here's design simplicity

Farval's Time-Tested Dualine Valve



1

(In red) Lubricant under hydraulic pressure enters inlet at top right — pushing slide valve down and filling upper diagonal passage and chamber above main piston.

(In blue) By this movement, lower head of piston slide valve uncovers lower diagonal passage leading from the main piston chamber. This chamber is full of lubricant from the previous operation.

2

(In red) Lubricant under pressure entering through upper inlet port and into main chamber continues to force main piston downward —

(In blue) discharging lubricant through lower diagonal passage to vertical passage and to outlet port leading to bearing.

3

(In red) Lubricant entering from upper port has now forced the main piston to end of its stroke, and thus the full measured charge below piston has been delivered to the bearing.

Note that indicator stem has also moved down, indicating main piston has reached end of its stroke, and that no more lubricant will be delivered from this operation.

4

(In blue) Lubricant under hydraulic pressure enters inlet at bottom right — pushing slide valve up and filling lower diagonal passage and chamber below main piston.

(In red) By this movement, upper head of piston slide valve uncovers upper diagonal passage leading from the main piston chamber. This chamber is full of lubricant from the previous operation.

5

(In blue) Lubricant under pressure entering through lower inlet port and into main chamber continues to force main piston upward —

(In red) discharging lubricant through upper diagonal passage t vertical passage and to outlet port leading to the bearing.

6

(In blue) Lubricant continuing to enter under pressure from the lower port has now forced main piston to the end of its stroke, and thus the full measured charge above piston has been delivered to the bearing.

Indicator has reached its top limit, showing the job is done.

That's why *FARVAL DUALINE* is today's most dependable, positive system of centralized lubrication

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No Springs
No Check Valves
No Small Ports
Measures By Piston Displacement
Has But Two Moving Parts
Is Individually Adjustable
Will Distribute Either Oil Or Grease
A Positive Indicator At Every Bearing

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FALK

A GOOD NAME IN INDUSTRY

20,000 hp at 100 rpm

...or 75 hp at 100 rpm

THE FALK *ALL-STEEL*, ALL-MOTOR MOTOREDUCER
(also available in integral models)
...one of America's First Family of Power Transmission Products

Other Members:

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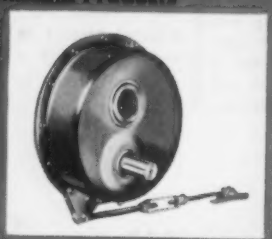
—up to 125 hp. Ask for Bulletin 7100. Also Flange Mounted and Screw Conveyor Drives.



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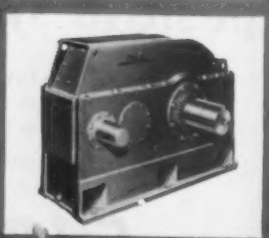
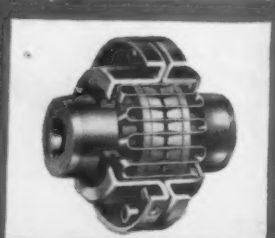
Parallel Shaft up to 3500 hp. Ask for Bulletin 1100. Also Right Angle and Concentric Shaft designs.



STEELFLEX COUPLINGS
All-steel, torsionally resilient. 34 sizes, from .3 to 130,000 hp at 100 rpm. Ask for Bulletin 4100.



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A POINT TO PONDER...*when you need gear drives or shaft couplings of "FALK OR EQUAL" quality, where but from Falk can you get the "OR EQUAL"?*

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